

*Appendix 1: Statutes and Executive Orders
to be Considered by EPA in the Final
Rule-Making*

Appendix 1
Statutes and Executive Orders to be Considered by EPA in the Final Rule-Making

Statutes	Summary
<i>Paperwork Reduction Act (PRA)</i> (44 U.S.C. 3501 <i>et seq.</i>)	Directs federal agencies to minimize paperwork burden; requires timely and equitable dissemination of public information
<i>Regulatory Flexibility Act (RFA)</i> 5 U.S.C. 601 <i>et seq.</i>	Requires federal agencies to identify and appraise regulatory burdens on small entities; requires consideration of regulatory alternatives to minimize those burdens
<i>Congressional Review Act (CRA)</i> (SBREFA, Subtitle E, 5 U.S.C. 801-808)	Requires federal agencies to assess all final rules to determine if Congressional review requirements apply
<i>National Technology Transfer and Advancement Act (NTTAA)</i> (15 U.S.C. 272 <i>note</i>)	Requires federal agencies to utilize already existing technical standards in regulatory activities; requires ongoing participation in the development of these technical standards
<i>Unfunded Mandates Reform Act (UMRA)</i> 2 U.S.C. 602, 658, 1501-4, 1511-16, 1531-8, 1551-6	Requires federal agencies to assess the effects of regulatory actions on state, local, and tribal governments (SLTGs) and the private sector; requires notification of potentially affected small governments and opportunity for their participation in the rule making process

Executive Orders	Summary
<i>EO 12866 Regulatory Planning and Review</i>	Requires federal agencies to seek involvement of those who will benefit or be burdened by a proposed rule; requires submission of Asignificant@ regulatory actions for OMB review
<i>EO 13132 Federalism</i>	Requires federal agencies to develop an accountable process to ensure meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications
<i>EO 12898 Environmental Justice</i>	Requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations
<i>EO 13045 Children=s Health Protection (CHP)</i>	Requires federal agencies to provide additional information if there is reason to believe that a rule concerns an environmental or safety risk that may disproportionately affect children
<i>EO 13084 Consultation and Coordination with Tribal Governments</i>	Requires federal agencies to have an effective process to permit elected officials and other representatives of Tribal governments to provide meaningful and timely input in development of regulatory policies

***Appendix 2: Stations of SCAR Nations
Operating in the Antarctic, Winter 1999***

Appendix 2
Stations of SCAR Nations Operating in the Antarctic,
Winter 1999

THE INTERNATIONAL COUNCIL FOR SCIENCE
SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH

SCAR BULLETIN
No 135, October 1999

Stations of SCAR Nations operating in the Antarctic,
Winter 1999

Stations are numbered clockwise from the Greenwich Meridian

*Stations north of 60°S +Stations on King George Island

Argentina

40	Belgrano II	77°52'29"S	34°37'37"W
36	Esperanza	63°23'42"S	56°59'46"W
32	+Jubany	62°14'16"S	58°39'52"W
37	Marambio	64°14'42"S	56°39'25"W
38	Orcadas	60°44'20"S	44°44'17"W
22	San Martin	68°07'47"S	67°06'12"W

Australia

16	Casey	66°17'00"S	110°31'11"E
13	Davis	68°34'38"S	77°58'21"E
18	*Macquarie Island	54°29'58"S	158°56'09"E
8	Mawson	67°36'17"S	62°52'15"E

Brazil

34	+Comandante Ferraz	62°05'00"S	58°23'28"W
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Chile

25	Capitan Arturo Prat	62°30'S	59°41'W
35	General Bernardo O'Higgins	63°19'S	57°54'W
28	+Presidente Eduardo Frei	62°12'S	58°58'W
26	+Escudero	62°11'57"S	58°58'35"W

China

27	+Great Wall	62°12'59"S	58°57'44"W
10	Zhongshan	69°22'16"S	76°22'11"E

France

7	*Alfred Faure, Iles Crozet	46°25'48"S	51°51'40"E
17	Dumont d'Urville	66°39'46"S	140°00'05"E
12	*Martin de Viviès, Ile Amsterdam	37°49'48"S	77°34'12"E
9	*Port aux Français, Iles Kerguelen	49°21'05"S	70°15'20"E

Germany

43	Neumayer	70°38'00"S	08°15'48"W
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India

2	Maitri	70°45'57"S	11°44'09"E
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Japan

5	Syowa	69°00'25"S	39°35'01"E
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Korea

31	+King Sejong	62°13'24"S	58°47'21"W
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New Zealand

20	Scott Base	77°50'60"S	166°45'46"E
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Poland

33	+Arctowski	62°09'34"S	58°28'15"W
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Russia

29	+Bellingshausen	62°12'S	58°58'W
14	Mirny	66°33'S	93°01'E
6	Molodezhnaya	67°40'S	45°51'E
3	Novolazarevskaya	70°46'S	11°50'E
11	Progress	69°23'S	76°23'E
15	Vostok	78°28'S	106°48'E

South Africa

42	*Gough Island	40°21'S	09°52'W
4	*Marion Island	46°52'34"S	37°51'32"E
44	SANAE IV	71°40'25"S	02°49'44"W

Ukraine

23	Vernadsky	65°14'43"S	64°15'24"W
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United Kingdom

39	*Bird Island	54°00'31"S	38°03'08"W
41	Halley	75°35'23"S	26°25'28"W
21	Rothera	67°34'10"S	68°07'12"W

United States

1	Amundsen-Scott	89°59'51"S	139°16'22"E
19	McMurdo	77°50'53"S	166°40'06"E
24	Palmer	64°46'30"S	64°03'04"W

Uruguay

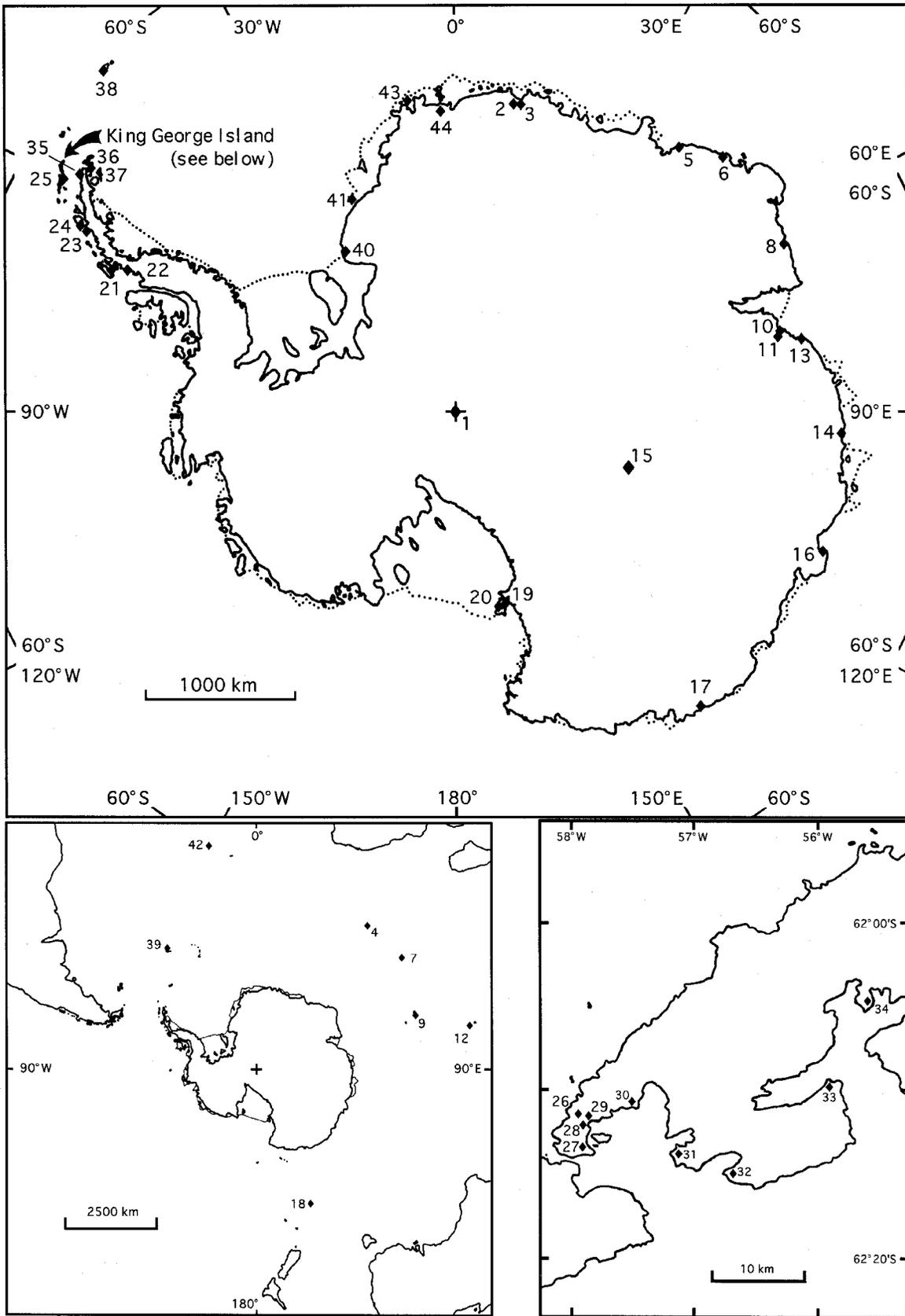
30	+Artigas	62°11'04"S	58°54'09"W
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**Stations of SCAR Nations operating in the Antarctic,
Winter 1999**

Stations are numbered clockwise from the Greenwich Meridian.

*Stations north of 60°S +Stations on King George Island

1	Amundsen-Scott	United States	89°59'51"S	139°16'22"E
2	Maitri	India	70°45'57"S	11°44'09"E
3	Novolazarevskaya	Russia	70°46'S	11°50'E
4	*Marion Island	South Africa	46°52'34"S	37°51'32"E
5	Syowa	Japan	69°00'25"S	39°35'01"E
6	Molodezhnaya	Russia	67°40'S	45°51'E
7	*Alfred Faure, Iles Crozet	France	46°25'48"S	51°51'40"E
8	Mawson	Australia	67°36'17"S	62°52'15"E
9	*Port aux Français, Iles Kerguelen	France	49°21'05"S	70°15'20"E
10	Zhongshan	China	69°22'16"S	76°22'11"E
11	Progress	Russia	69°23'S	76°23'E
12	*Martin de Viviès, Ile Amsterdam	France	37°49'48"S	77°34'12"E
13	Davis	Australia	68°34'38"S	77°58'21"E
14	Mirny	Russia	66°33'S	93°01'E
15	Vostok	Russia	78°28'S	106°48'E
16	Casey	Australia	66°17'00"S	110°31'11"E
17	Dumont d'Urville	France	66°39'46"S	140°00'05"E
18	*Macquarie Island	Australia	54°29'58"S	158°56'09"E
19	McMurdo	United States	77°50'53"S	166°40'06"E
20	Scott Base	New Zealand	77°50'60"S	166°45'46"E
21	Rothera	United Kingdom	67°34'10"S	68°07'12"W
22	San Martin	Argentina	68°07'47"S	67°06'12"W
23	Vernadsky	Ukraine	65°14'43"S	64°15'24"W
24	Palmer	United States	64°46'30"S	64°03'04"W
25	Capitan Arturo Prat	Chile	62°30'S	59°41'W
26	+Escudero	Chile	62°11'57"S	58°58'35"W
27	+Great Wall	China	62°12'59"S	58°57'44"W
28	+Presidente Eduardo Frei	Chile	62°12'S	58°58'W
29	+Bellingshausen	Russia	62°12'S	58°58'W
30	+Artigas	Uruguay	62°11'04"S	58°54'09"W
31	+King Sejong	Korea	62°13'24"S	58°47'21"W
32	+Jubany	Argentina	62°14'16"S	58°39'52"W
33	+Arctowski	Poland	62°09'34"S	58°28'15"W
34	+Comandante Ferraz	Brazil	62°05'00"S	58°23'28"W
35	General Bernardo O'Higgins	Chile	63°19'S	57°54'W
36	Esperanza	Argentina	63°23'42"S	56°59'46"W
37	Marambio	Argentina	64°14'42"S	56°39'25"W
38	Orcadas	Argentina	60°44'20"S	44°44'17"W
39	*Bird Island	United Kingdom	54°00'31"S	38°03'08"W
40	Belgrano II	Argentina	77°52'29"S	34°37'37"W
41	Halley	United Kingdom	75°35'23"S	26°25'28"W
42	*Gough Island	South Africa	40°21'S	09°52'W
43	Neumayer	Germany	70°38'00"S	08°15'48"W
44	SANAE IV	South Africa	71°40'25"S	02°49'44"W



Appendix 2-3

*Appendix 3: Peninsula Area Sites Visited
by Ship Based Tours for the 8-Year Period,
1989- 1997: Sites Grouped by Number of
Visitors at the Sites*

Appendix 3
Peninsula Area Sites Visited by Ship Based Tours for the 8-Year Period,
1989-1997: Sites Grouped by Number of Visitors at the Sites

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Appendix 3
Peninsula Area Sites Visited by Ship Based Tours for the 8-Year Period,
1989-1997: Sites Grouped by Number of Visitors at the Sites

The information for the following tables was initially compiled by the National Science Foundation based on information submitted by ship-based operators touring the Peninsula Area, and summarized by Naveen¹.

Table 3.1. Sites with 10,000 or More Visitors				
Rank	Location	Region	Landings	Visitors (PAX)
1	Whaler's Bay, Deception Island	S. Shetland Islands	296	24,554
	Half Moon Island	S. Shetland Islands	197	20,228
3	Port Lockroy, Wiencke Island	NW Peninsula	212	19,723
	Cuerverville Island	NW Peninsula	251	19,571
5	Pendulum Cove, Deception Island	S. Shetland Islands	219	17,928
	Hannah Point, Livingston Island	S. Shetland Islands	203	17,063
7	Petermann Island	SW Peninsula	198	16,911
	Almirante Brown St. Vic.	NW Peninsula	208	16,778
9	Waterboat Point, Paradise B	NW Peninsula	116	15,358
	Paulet Island	NE Peninsula	151	14,355
11	Arctowski St. Vic., KGI	S. Shetland Islands	142	12,627
Totals for 1989-1997			2,193	195,096*

*The total visitors (PAX) represents the total number of passengers landed at the listed locations, not the total number of passengers to visit the Peninsula area during the listed 8-year period; passengers on a given cruise vessel may have landed at more than one site on this list.

Table 3.2. Sites with 1,000 to 9,999 Visitors				
Rank	Location	Region	Landings	Visitors (PAX)
12	Baily Hd/Rancho Pt, D. Island	S. Shetland Islands	109	8,671
13	Palmer Station, Anvers Island	NW Peninsula	78	8,372
14	Hope Bay	NE Peninsula	68	7,656
15	Penguin Island	S. Shetland Islands	83	6,224
16	Aitcho Islands	S. Shetland Islands	85	6,195
17	Point Lookout, Elephant Island	S. Orkney Island/Elephant Island	43	4,857
18	Paradise Bay (nonspec)	NW Peninsula	58	4,511

¹ Naveen, Ron. *Compendium of Antarctic Peninsula Visitor Sites, A Report to the Governments of the United States and the United Kingdom*. Oceanites, Inc., Chevy Chase, MD. November 1997

Table 3.2.Sites with 1,000 to 9,999 Visitors				
Rank	Location	Region	Landings	Visitors (PAX)
19	Neko Harbor, Andvord Bay	NW Peninsula	83	4,503
20	Frei Station, KGI	S. Shetland Islands	41	4,445
21	Yankee Harbor, Grnwich Island	S. Shetland Islands	41	4,380
22	Pleneau Islands	SW Peninsula	66	4,327
23	Georges Point, Ronge Island	NW Peninsula	88	4,286
24	Ferraz St. Vic., KGI	S. Shetland Islands	41	3,816
25	Torgersen Island, Arthur Harbor	NW Peninsula	39	3,738
26	Telefon Bay, Deception Island	S. Shetland Islands	45	3,669
27	Portal Point	NW Peninsula	46	3,367
28	Shingle Cove, Coronatn Island	S. Orkney Island/Elephant Island	22	2,521
29	Akad. Vernadskiy St	SW Peninsula	31	2,403
30	Bellingshausen St., KGI	S. Shetland Islands	35	2,357
31	Jubany Station, KGI	S. Shetland Islands	18	2,111
32	Lion's Rump, KGI - SSSI	S. Shetland Islands	17	1,779
33	Hovgard Island	SW Peninsula	9	1,707
34	Ardley Island - SSSI	S. Shetland Islands	11	1,615
35	Orcadas Station Vic.	S. Orkney Island/Elephant Island	16	1,355
36	Yalour Islands	SW Peninsula	20	1,336
37	Danco Island, Graham Land	NW Peninsula	25	1,223
38	Deception Island	S. Shetland Islands	18	1,191
39	Point Wild, Elephant Island	S. Orkney Island/Elephant Island	12	1,098
40	Dorian Bay/Damoy Point	NW Peninsula	10	1,010
41	Devil Island	NE Peninsula	13	1,009
Totals for 1989-1997			1,268	105,546*

*The total visitors (PAX) represents the total number of passengers landed at the listed locations, not the total number of passengers to visit the Peninsula area during the listed 8-year period; passengers on a given cruise vessel may have landed at more than one site on this list.

Table 3.3.Sites with 100 to 999 Visitors				
Rank	Location	Region	Landings	Visitors (PAX)
42	Detaille Island	S. Shetland Islands	9	911
43	Brown Bluff	NE Peninsula	15	853
44	Coronation Island	S. Orkney Island/Elephant Island	6	839

Table 3.3.Sites with 100 to 999 Visitors				
Rank	Location	Region	Landings	Visitors (PAX)
45	Hydrurga Rocks	NW Peninsula	13	781
46	Camara St., Half Moon Island	S. Shetland Islands	6	768
47	Snow Hill Island	NE Peninsula	10	741
48	Mikklesen Harbor, Trty Island	NW Peninsula	15	723
49	Prospect Pt, Graham Land	SW Peninsula	9	718
50	Melchior Islands	NW Peninsula	11	701
51	Damoy Point, Wiencke Island	NW Peninsula	7	691
52	Orne Islands	NW Peninsula	11	665
53	Turrett Point, KGI	S. Shetland Islands	9	610
54	Aruro Prat St, Grnwich Island	S. Shetland Islands	7	583
55	Crystal Hill, Trnty Penisula	NW Peninsula	6	517
56	Astrolabe Island	NW Peninsula	12	512
57	Rothers St, Adelaide Island	SW Peninsula	4	502
58	Primavera Base (SSSI)	NW Peninsula	14	477
59	Charlotte Bay	NW Peninsula	5	441
60	Laurie Island (nonspec)	S. Orkney Island/Elephant Island	4	395
61	Maxwell Bay, KGI (nonspec)	S. Shetland Islands	6	392
62	King Sejong St, KGI	S. Shetland Islands	3	371
63	Fish Islands, Graham Land	SW Peninsula	3	342
64	Penguin Point, Seymour Island	NE Peninsula	5	341
65	Dorian Bay, Wiencke Island	NW Peninsula	3	319
66	Cierva Cove — SSSI	NW Peninsula	4	310
67	Elephant Island (nonspec)	S. Orkney Island/Elephant Island	4	309
68	Goudier Is, Pt Lockroy	NW Peninsula	4	306
69	View Pt, Trinity Pen	NE Peninsula	4	306
70	Orne Harbor, Graham Land	NW Peninsula	4	296
71	Crystal Sd, Pendelton Island	SW Peninsula	2	290
72	Signy Island (nonspec)	S. Orkney Island/Elephant Island	4	279
73	Skontrop Cove, Pardse Bay	NW Peninsula	7	257
74	Arago Glacier, And. Bay	NW Peninsula	6	251
75	Duthoit Point, Nelson Island	S. Shetland Islands	2	244
76	Petrel St, Dundee Island	NE Peninsula	4	242

Table 3.3.Sites with 100 to 999 Visitors				
Rank	Location	Region	Landings	Visitors (PAX)
77	Danger Island	NE Peninsula	7	240
78	Rosamel Island	NE Peninsula	2	236
79	Gosling Island, S. Orkney Island	S. Orkney Island/Elephant Island	2	235
80	King George Island (nonspec)	S. Shetland Islands	3	234
81	Molchanov Beach, Jnvlc Island	NW Peninsula	6	223
82	Artigas Station, KGI	S. Shetland Islands	3	212
83	Chang Chen St., KGI	S. Shetland Islands	3	206
84	Foyn Harbor	NW Peninsula	4	199
85	Admiralty Sound	NE Peninsula	3	185
86	Adelaide Island	SW Peninsula	2	183
87	Robert Point, Robert Island	S. Shetland Islands	3	163
88	Gin Cove, James Ross Island	NE Peninsula	2	161
89	Cape Gage, James Ross Island	NE Peninsula	2	158
90	Seymour Island (nonspec)	NE Peninsula	3	158
91	Hanusse Bay	SW Peninsula	2	148
92	Cape Valentine, Elphnt Island	S. Orkney Island/Elephant Island	2	146
93	Cape Dundas, Laurie Island	S. Orkney Island/Elephant Island	1	138
94	Curtiss Bay, Graham Land	NW Peninsula	4	137
95	Bradbrooke Island, Aitcho Island	S. Shetland Islands	1	136
96	Trinity Island	NW Peninsula	2	135
97	False Bay, Livingston Island	S. Shetland Islands	1	127
98	Cormorant Island, vic.	NW Peninsula	1	125
99	South Bay, Livingston Island	S. Shetland Islands	1	125
100	Argentine Island (unspec)	SW Peninsula	1	112
101	Pr Gustav Chn (unspec)	NE Peninsula	1	105
102	Heywood Island, (Roberts Island)	S. Shetland Islands	1	102
Totals for 1989-1997			304	21,798*

*The total visitors (PAX) represents the total number of passengers landed at the listed locations, not the total number of passengers to visit the Peninsula area during the listed 8-year period; passengers on a given cruise vessel may have landed at more than one site on this list.

Table 3.4.Sites with 0 to 99 Visitors				
Rank	Location	Region	Landings	Visitors (PAX)
103	Lagarrigue Cove	NW Peninsula	1	99
104	Bernardo O'Higgins St	NW Peninsula	1	95
105	San Martin Station	SW Peninsula	1	95
106	Alcock Island	NW Peninsula	2	92
107	Holluschickie Bay, JRI	NE Peninsula	1	91
108	Heroína Island	NE Peninsula	1	90
109	Pitt Pt (Victory Glacier)	NW Peninsula	1	88
110	Pitt Islands	SW Peninsula	1	87
111	Fildes Peninsula (nonsp)	S. Shetland Islands	1	85
112	Barcroft Islands	SW Peninsula	1	83
113	Point Martin, S Orkney Island	S. Orkney Island/Elephant Island	1	80
114	Rum Cove, James Ross Island	NE Peninsula	1	80
115	Camp Point, Graham Island	SW Peninsula	1	78
116	Martel Inlet, KGI	S. Shetland Islands	1	78
117	Port Charcot, Booth Island	SW Peninsula	1	74
118	Kinnes Cove, Joinville Island	NW Peninsula	1	71
119	Cape Melville, KGI	S. Shetland Islands	1	58
120	Takai Peninsula	NW Peninsula	1	52
121	Sprightly Islands Vic.	NW Peninsula	1	48
122	Useful Island	NW Peninsula	1	47
123	Cape Tuxen, Graham Land	SW Peninsula	2	46
124	Gabriel de Dastilla St.	S. Shetland Islands	1	42
125	Signy Base, S Orkney Is	S. Orkney Island/Elephant Island	1	42
126	Gaston Island, Reclus Pen	NW Peninsula	1	40
127	Pt. Thomas, KGI — SSSI	S. Shetland Islands	1	38
128	"Small Island", Christiana Island	NW Peninsula	1	38
129	Ezcurra Inlet, KGI	S. Shetland Islands	1	36
130	Macaroni Pt, Deception Island	S. Shetland Islands	1	36
131	Intercurrence Island	NW Peninsula	1	34
132	d'Urville Monument	NE Peninsula	1	34
133	Spigot Peak, Graham Land	NW Peninsula	1	33
134	Suarez Glacier, Prdse Bay	NW Peninsula	1	32

Table 3.4. Sites with 0 to 99 Visitors				
Rank	Location	Region	Landings	Visitors (PAX)
135	Comb Ridge, James Ross Island	NE Peninsula	1	31
136	Challenger Island, Grham Land	NW Peninsula	1	27
137	Murray Island, Graham Land	NW Peninsula	1	27
138	Heim Glacier, Graham Land	SW Peninsula	1	19
139	Mt. Mill, Graham Land	SW Peninsula	1	16
140	Small peak (nonspec)	NW Peninsula	1	15
141	Mt. Scott, Lemaire Chn	SW Peninsula	1	14
142	Blaicklock Island, Grham Land	SW Peninsula	1	9
143	Fumarole Bay, Decptn Island	S. Shetland Islands	1	8
Totals for 1989-1997			43	2,187*

*The total visitors (PAX) represents the total number of passengers landed at the listed locations, not the total number of passengers to visit the Peninsula area during the listed 8-year period; passengers on a given cruise vessel may have landed at more than one site on this list.

*Appendix 4: Characteristics of the Eleven
Most Visited Tourist Sites in the Peninsula
Area for the 8-Year Period 1989-1997*

Appendix 4
Characteristics of the Eleven Most Visited Tourist Sites in the Peninsula Area
for the 8-Year Period 1989-1997

<u>Site No.</u>	<u>Site Name and Location</u>	<u>Page</u>
1	Whaler's Bay, Deception Island, South Shetland Islands	Appendix 4-2
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3	Port Lockroy, Wiencke Island, Northwest Peninsula, 64/ 49'S, 63/ 30'W	Appendix 4-4
4	Cuverville Island, Northwest Peninsula, 64/ 41'S, 62/ 38'W	Appendix 4-5
5	Pendulum Cove, Deception Island, South Shetland Islands, 62/ 36'S, 59/ 55'W	Appendix 4-6
6	Hannah Point, Livingston Island, South Shetland Islands, 62/ 36'S, 59/ 55'W	Appendix 4-6
7	Petermann Island, Southwest Peninsula, 62/ 36'S, 59/ 55'W	Appendix 4-7
8	Almirante Brown Station, vicinity Paradise Bay, Northwest Peninsula, 62/ 36'S, 59/ 55'W	Appendix 4-8
9	Waterboat Point, Paradise Bay, Northwest Peninsula, 62/ 36'S, 59/ 55'W	Appendix 4-9
10	Paulet Island, Northeast Peninsula, 62/ 36'S, 59/ 55'W	Appendix 4-10
11	Arctowski Station, vicinity King Geo. Island, South Shetland Islands, 62/ 36'S, 59/ 55'W	Appendix 4-11

Appendix 4
Characteristics of the Eleven Most Visited Tourist Sites
in the Peninsula Area for the 8-Year Period 1989-1997

1) Whaler's Bay, Deception Island, South Shetland Islands

PHYSICAL DESCRIPTION: Small bay first encountered after passing through Neptune's Bellows into Port Foster. The Bay's name is based on its heavy use by whalers at the turn of the 20th century. Deception Island is ring-shaped, 8 nautical miles in diameter, enclosing Port Foster harbor. Whaler's Bay, inside the Deception Volcano's caldera, is a landlocked basin 5 nautical miles long from NW to SE and 3.5 nautical miles wide. Deception is the largest of three recent volcanic centers in the South Shetlands, Penguin and Bridgeman Islands being the other two. The rim has an average elevation of 300 meters, with highest points at Mt. Pond (542 meters) to the east and Mt. Kirkwood (467 meters) to the south; it is composed of lava and cinders, but above 100 meters it is dominated by glaciers and ash-covered ice that reaches the sea at many places along the coast and on the east side of Port Foster. The water in Port Foster is warmer than the surrounding sea because of numerous active fumaroles. A long black sand beach stretches along the eastern shore north of Baily Head. Recent (and suspected) eruptions have occurred in 1800, 1812, 1829?, 1842, 1871, 1909?, 1912, 1927?, 1956, 1967, 1969, 1970 and 1972.

Whaler's Bay has a SW-facing beach just inside and to the north of the caldera indentation known as Neptune's Bellows. A broad cinder beach extends over 100 m from the water's edge to the steeply-rising inner wall of the caldera. Behind the abandoned whale-processing plant, the glacier meets the apron of cinders. To the SE, the caldera rim is partially breached at Neptune's Window, and the bedrock of the rim is exposed along a steep, 2-km long section of cliff extending from east of Neptune's Window to Neptune's Bellows.

Pyroclastic debris ranging in size from coarse ash to small lapilli covers the entire broad area of the beach and back shore to the inner wall of the caldera. These cinders are mostly black, and cover many of the old barrels, whale bones, and other debris from the whaling and research groups that occupied the area until recently. Several melt-water streams from the snow and glacier above form channels cutting through the beach. The beach is flat and has a very shallow slope both onshore and offshore. Steam may rise from hot springs along the shoreline, and gas rising from the springs has a strong, sulfurous odor.

STATION(S): None

FAUNA & FLORA:

Penguins & flying birds: Kelp gulls nest on some of the abandoned onshore buildings. Pintado petrels and Wilson's storm-petrels nest on the cliffs and scree between Neptune's Window and Neptune's Bellow. Antarctic terns are regularly seen, and suspected of breeding inland, behind the abandoned British station. No site-specific penguin breeding populations are listed in Woehler (1993, 1996).

Seals: Weddell, crabeater and Antarctic fur seals regularly haul-out on the beach.

Moss beds/lichens/plants: There are extensive *Usnea*, spp.¹ patches between Neptune's Window and Neptune's Bellow. Crustose lichens *Xanthoria*, spp. and *Caloplaca*, spp. also noted on cliff sides. *Deschampsia* noted behind the abandoned British station.

UNUSUAL FEATURES: Neptune's Window, the deformation in the caldera to the south.

¹ The designation "spp." indicates the presence of animals, lichens, or moss in a particular genus, but not of a specific species within that genus.

SENSITIVITY FACTORS: Extensive *Usnea*, spp. patches between Neptune's Window and Neptune's Bellows are easily accessed. The boundary to the Kroner Lake SSSI (SSSI 21, Part E) is ill-defined and easily encroached.

HISTORICAL ARTEFACTS: HSM 31 is a memorial plaque marking the position of a cemetery where approximately 40 Norwegian whalers were buried in the first half of the 20th century; the cemetery was swept away by the February 1969 volcanic eruption. There is also a claim with memorial plaque, HSM 58, to honor captain Adolphus Amandus Andresen who established the first whaling operation at Deception Island in 1906.

SSSI/SSA: Kroner Lake SSSI at the southern end of the long shoreline.

LANDING CHARACTERISTICS: The onshore boilers are remnants from previous shore-based whaling activities. The Kroner Lake SSSI is at the southern end of the long shoreline. The remains of the abandoned British Antarctic Survey base are located between Kroner Lake and the boilers. Petrel nests are scattered rather widely over a vast area between the shoreline and a feature in the caldera wall known as Neptune's Window. Whalers Bay is located "inside" the caldera of Deception Island, and is the first landing site reached after passing inside Deception through the narrow passage known as Neptune's Bellows. Little wildlife is present, though Antarctic terns frequent the *Deschampsia*-laden hillsides behind the ruined station, and assortment of skuas often collects in the melt pools just off the landing beach, and fur seals often straggle in to roam the long, warm, black sand beach, typically collecting at the far end toward Neptune's Window. The water is volcanically heated, often leaving roasted, boiled krill along the shoreline.

2) Half Moon Island, South Shetland Islands, 62/36'S, 59/55'W

PHYSICAL DESCRIPTION: A 1.25 mile-long, crescent-shaped island lying in the entrance to Moon Bay on the east side of Livingston Island. The island was known by sealers as early as 1821.

STATION(S): Argentine Camara Station located on the island's SW side

FAUNA & FLORA:

Penguins & flying birds: Confirmed nesting species include: chinstrap penguins, blue-eyed shags, Wilson's storm-petrels, kelp gulls, snowy sheathbills, Antarctic terns and Antarctic brown skuas. Recent (1995) surveys indicate a minimum breeding population of 3,342 pairs of chinstrap penguins, an increase from 2,500 pairs counted in 1987 (Woehler, 1996).

Seals: Southern elephant, Weddell and Antarctic fur seals regularly haul-out on the beaches.

Moss beds/lichens/plants: Crustose lichens, spp. noted. (Much snow cover, more survey of floral communities needed.)

UNUSUAL FEATURES: None noted.

SENSITIVITY FACTORS: Heavy snow cover often restricts visitor space and narrows distance between visitors and breeding chinstrap penguins. Kelp gull and Antarctic tern nests easily disturbed; scree slopes have nesting Wilson's storm-petrels.

HISTORICAL ARTEFACTS: None noted.

SSSI/SSA: None

LANDING CHARACTERISTICS: Half Moon is the site of the Argentine Camara Station, and at one point was the locus for a joint tourism impact study run by U.K., Argentine and Chilean interests. Station personnel and biologists from the Argentine Antarctic Institute continue to monitor the island's penguin and flying bird

populations. From the regular landing beach on the NE shore, marked by a rotting old dory, it is necessary to climb toward a navigation tower on the ridge above, in order to reach the pathway leading to the major chinstrap colonies on the eastern extremity of the island. There may be heavy snow cover which makes hiking difficult. On the pathway to the eastern spit, Wilson's storm-petrels, Antarctic terns, sheathbills and kelp gulls may be encountered.

3) Port Lockroy, Wiencke Island, Northwest Peninsula, 64/ 49'S, 63/ 30'W

PHYSICAL DESCRIPTION: A harbor, 0.5 mile long and wide, entered between Flag Point and Lecuyer Point on the west side of Wiencke Island, in the Palmer Archipelago, it was discovered by Charcot's French Antarctic expedition (1903-05) and named for Edouard Lockroy, the French politician who assisted Charcot in obtaining government backing for his expedition. Most visitor landings have taken place at Jougla Point, which slopes gently upward to a flat area about 10 m above sea level, and then further to a minor summit about 100 m above sea level. Inland, there are steep and rugged mountain slopes. Snow cover may be considerable through mid-December, when extensive areas of outcrop on the ridges and summit of this area become snow-free. Many of the outcrops are occupied by the nests of gentoo penguins and are partially covered with guano, which creates a layer of organic soil. At Jougla Point, the water comes directly over bare, rocky outcrops of diorite and quartz diorite composition. Just above, on what may be a raised beach, there are numerous gentoo penguin nests among the rounded cobbles, boulders and pebbles. In mid- to late summer, this area is awash in guano and mud. Several large, tidewater glaciers flow into Alice Creek to the east of, and behind, Jougla Point. This small bay is often covered with fast ice. Port Lockroy harbor is substantially protected, and provides an excellent lee from the often windblown Neumayer Channel and Gerlache Strait.

STATION(S): None

FAUNA & FLORA:

Penguins & flying birds: Gentoo penguins, kelp gulls, blue-eyed shags and skuas, spp. are confirmed breeders.

Seals: Weddell occasionally haul-out along Alice Creek shoreline.

Moss beds/lichens/plants: *Xanthoria*, spp. and other crustose lichens, spp. noted on exposed rocks near Red Rocks gentoo colony; scattered *Prasiola crispa* also noted. Photo documentation of: *Xanthoria candelaria*, *Mastodia tessellata*, *Xanthoria elegans* and/or *Caloplaca lucens*, and *Buellia*, spp.

UNUSUAL FEATURES: None noted.

SENSITIVITY FACTORS: Restricted visitor space among the gentoo penguins in the vicinity of the Jougla Point landing rocks; the situation is compounded later in the summer when snow melt and guano runoff make walking/hiking more difficult. Easily disturbed blue-eyed shag nests on Jougla Point.

HISTORICAL ARTEFACTS: The Operation Tabarin hut on Goudier Island, HSM 61, has been restored and will be manned, beginning in the 1996-97 summer to accommodate inquiring visitors.

SSSI/SSA: None noted.

LANDING CHARACTERISTICS: From the usual landing site at Jougla Point, small discrete groups of gentoos and shags are easily reached. The shags are primarily found on the seaward edges of Jougla Point. This location is across a narrow inlet from the recently restored British Antarctic Survey hut on Goudier Island. In the vicinity of Jougla Point, the breeding groups of gentoos and shags are at times tightly packed; in late summer, the site becomes a quagmire of guano, mud and snow melt. Proceeding upward from the landing rocks at the tip of the point, numerous groups of gentoos are encountered. Seals often haul-out around the inner bay at Alice Creek. Along these shores are many whalebones. The Red Rock colony of

gentoos serves as a prospective control colony, and is only reached via a steep climb. Numerous kelp gulls breed on ledges below Red Rock. Breeding skuas may be found toward Lecuyer Point, SE of Jougla Point.

4) **Cuvertville Island, Northwest Peninsula, 64/ 41'S, 62/ 38'W**

PHYSICAL DESCRIPTION: A rocky island with extensive moss cover at higher elevations, lying in the Errera Channel between Arctowski Peninsula and the north part of Ronge Island, off the west coast of Graham Land. It was discovered by Gerlache's Belgian Antarctic expedition (1897-99), and named by Charcot for a vice-admiral in the French Navy. Nearly vertical cliffs surround the island except on the northeast coast, where a gently sloping apron of bedrock extends 200 meters from the shore to the base of the cliffs. Much of the apron on the northeastern side of the island may remain snow-covered through much of December. Large, bare rock areas of this platform provide nesting sites for gentoo penguins. The surface occupied by the penguins, although largely on bedrock or raised beach deposits, is covered with guano, mud, and other organic debris. The water level rises to a narrow beach (often with overhanging snow/ice), which comprises a wide range of rounded boulders and cobbles of several types. Outcrops occupied by the penguins are highly cryoturbated (i.e., broken and churned by freezing and thawing), creating many small, flat, angular blocks. The whole lower section at the base of the cliffs has rounded outcrop surfaces that are glacially polished and grooved. A well-defined raised beach, south of the usual landing area and forming the nesting site for many gentoos, is located 8-10 meters above present sea level. This raised area is defined by a roughly flat terrace (hummocky from glaciated outcrops) with lots of small, partially rounded pebbles in hollows and on flat places, and suggests uplift of the land, lowering of sea level, or both during deglaciation. In all likelihood, a more careful examination would reveal several different levels of raised beaches that penguins have occupied during various stages of deglaciation.

STATION(S): None

FAUNA & FLORA:

Penguins & flying birds: Gentoo penguins, southern giant petrels, kelp gulls, Antarctic terns, snowy sheathbills, and skuas, spp. are confirmed breeders. Blue-eyed shags nest on the northeastern coast of the island, and Wilson's storm-petrels nest in the higher scree. Snow and pintado petrels also may nest in the highest part of the island.

Seals: Weddell and Antarctic fur seals were hauled-out during the Antarctic Site Inventory visits.

Moss beds/lichens/plants: *Xanthoria*, spp. and *Caloplaca*, spp. noted on exposed rocks, *Usnea*, spp. at higher elevations, and numerous patches of moss, spp. noted on cliff face that dominates the landing site. *Deschampsia antarctica* also noted. Photo documentation of: *Buellia*, spp.; *Polytrichum alpestre*; *Brachythecium austro-salebrosum*; *Bryum pseudotriquetrum*; *Prasiola crispa*; *Deschampsia antarctica*; and (possibly) *Acarospora marcrocyclos*.

UNUSUAL FEATURES: None noted.

SENSITIVITY FACTORS: Moss beds, once the snow cover is melted, may be trampled.

HISTORICAL ARTEFACTS: None noted.

SSSI/SSA: None noted.

LANDING CHARACTERISTICS: The cobble landing beach fronts a steep cliff, which is rich in flora concentrations and has quite a few high-nesting gentoos. There may be considerable snow cover early in the austral spring. The site contains many extensive moss patches, which may become obvious only after the snow begins to melt. The FAR NORTHWEST point is the location of an extensive skua club late in the summer season. The skuas nesting upslope at this end of the island vigorously defend their nests, and visitors are advised to keep clear.

5) Pendulum Cove, Deception Island, South Shetland Islands, 62/ 36'S, 59/ 55'W

PHYSICAL DESCRIPTION: The cove is located on the northeast side of Porter Foster, Deception Island, and its name relates to pendulum and magnetic observations made by a British expedition in 1829. The flat, black sand beach slopes gently offshore and forms a distinct beach ridge. From the beach, the ground slopes gently up to the Chilean research station that was destroyed during the 1967 eruption. The ground behind the ruins of the old station rises abruptly to the inner caldera wall, which at this point, is mostly covered with glacial ice from the east rim ice cap. A substantial hill is covered with ash and cinders that are deeply gullied. Section D of SSSI 21 is located here, and is intended to protect rare bryophytes (mosses), but its boundary is not clearly marked and is merely described as beginning at the high tide line. The beach is entirely composed of loose cinders, with no soil, and is used by visiting ships to conduct brief, Antarctic swims. There may be yellow algae and boiled krill floating on the surface, and the steam rising from the beach is laced with sulfurous odor. The beach is deeply gullied by melt-water streams, and erosion appears to be progressing at a rapid rate.

STATION(S): Chilean research station destroyed during the 1967 eruption

FAUNA & FLORA:

Penguins & flying birds: No species nest at this inhospitable site. Antarctic terns may visit, however, to pluck boiled krill and other invertebrates from the shore edge.

Seals: None

Moss beds/lichens/plants: None observed. Access to the SSSI, where rare bryophytes are located, is prohibited.

UNUSUAL FEATURES: Remains of the Chilean station destroyed during recent eruptions.

SENSITIVITY FACTORS: The boundary to SSSI 21, Part D, is not well defined.

HISTORICAL ARTEFACTS: None noted.

SSSI/SSA: SSSI 21, Part D

LANDING CHARACTERISTICS: Expedition companies often bring visitors to this site to swim where cold bay water mixes with volcanically heated water at the shoreline.

6) Hannah Point, Livingston Island, South Shetland Islands, 62/ 36'S, 59/ 55'W

PHYSICAL DESCRIPTION: This point forms the eastern side of the entrance to Walker Bay on the south coast of Livingston Island. It is named after the sealing vessel *Hannah* of Liverpool, which visited the South Shetland Islands and wrecked on this site in 1820. The regular landing site is a small, steep-faced, pocket beach about 50 meters wide. The beach rises to the ridge of a narrow isthmus between very steep, pointed peaks. West of this beach, the land surface slopes upward along a more-or-less planar surface to a knife-edged ridge on the north edge of this peninsula, from which nearly vertical sea cliffs plunge to the sea 30-50 meters below. A narrow beach stretches along the base of these cliffs. The shingle beach at the landing site and the north beach below the southern giant petrel ridge are composed of dark, rounded, fine-grained basaltic cobbles and pebbles. The ground to the west is basaltic, and covered extensively with *Prasiola crista*, which yields a green background to the extensive gentoo penguin colony found between the landing beach and inner Walker Bay. There are several round-bottomed gullies, deep in sandy and muddy material, along these upward slopes. The slopes appear to be eroding. Above the landing beach, to the northwest and at the edge of SUICIDE WALL, is an obvious jasper spur. The upper slopes are littered with limpet shells, presumably dropped by the resident, nesting kelp gulls.

STATION(S): None

FAUNA & FLORA:

Penguins & flying birds: Confirmed nesting species include: chinstrap, gentoo and macaroni penguins, blue-eyed shags, snowy sheathbill, kelp gull, pintado petrel, skuas, spp., and southern giant petrel. Antarctic terns nest elsewhere in Walker Bay. Wilson's storm-petrels have been observed on the higher slopes and presumably breed.

Seals: The site presents a few, regularly occupied southern elephant seal wallows, and its beaches occasionally have hauled-out Weddell and Antarctic fur seals.

Moss beds/lichens/plants: *Prasiola* is extensive. *Xanthoria*, spp. and other crustose lichens adorn many rocks and outcrops, and there are patches of *Colobanthus* and *Deschampsia*.

UNUSUAL FEATURES: Easily observed, nesting macaroni penguins, which are rare in the Antarctic Peninsula, but relatively common at Elephant Island and extraordinarily abundant at South Georgia.

SENSITIVITY FACTORS: High species diversity. Macaroni penguins are easily accessed. Restricted visitor space (much wildlife is accessed by hiking uphill above the landing beach toward the north beach cliff, then proceeding east toward SHAG POINT); elephant seals sometimes frequent the SUICIDE WALLOW above the north beach and care must be taken to avoid disturbing these animals (which have no easy route to the water). Close proximity to southern giant petrel nests on the northern ridge, which are easily accessed. Easily disturbed kelp gull and blue-eyed shag nests; storm-petrels nest in the scree.

HISTORICAL ARTEFACTS: None noted.

SSSI/SSA: None

LANDING CHARACTERISTICS: Hannah Point is located in Walker Bay, on the southwest side of Livingston Island. It is a site that represents a microcosm of Antarctic Peninsula fauna, with three species of penguins, kelp gulls, blue-eyed shags, southern giant petrels, and snowy sheathbills generally in attendance and nesting in close proximity to the regular landing beach. Small colonies of chinstrap penguins, and the occasionally occupied SUICIDE WALLOW with southern elephant seals are a short uphill walk from the landing beach. Extreme care must be taken not to disturb the seals in SUICIDE WALLOW, which may easily panic and are very close to a cliff edge. The petrels are easily accessed by visitors and care needs to be taken to avoid disturbances. Both southern elephant seals and Antarctic fur seals may be hauled-out on shore. While there are some gentoo penguins in the vicinity of the regular landing beach, the bulk of the gentoos occupy a large colony to the west toward inner Walker Bay.

7) Petermann Island, Southwest Peninsula, 62/36'S, 59/55'W

PHYSICAL DESCRIPTION: A one-mile long island lying one mile southwest of Hovgaard Island in the Wilhelm Archipelago, south of Lemaire Channel. The island is named for the German geographer, August Petermann, and was first discovered by a German expedition in 1973-74. It was at a cove on the southwest side of the island where the French explorer, Jean-Baptiste Charcot, and his vessel, Pourquoi Pas?, overwintered in 1909. Charcot named this cove Port Circumcision, for the holy day on which it was discovered. Petermann is a snow-covered, domed island that rises moderately steeply to a rocky summit, 150-200 meters above sea level. It has a rocky coastline indented by many small bays. There are abundant and nearly continuous rocky outcrops along the shore, near the abandoned Argentine research hut at Port Circumcision, on several ridges, and on the summit. Rookeries of Adelie penguins, gentoo penguins, and blue-eyed shags are on nearly soil-free bedrock, but a substantial layer of guano and other organic materials is accumulating. Early season snow cover, through mid-December, may be extensive. The water level is directly against bedrock along the coast, without any significant beach deposits. Some of the penguin colony areas with substantial numbers of pebbles may represent older raised beaches. There are many basaltic

dikes along the shoreline. Above the Point Circumcision hut, and on the small summit with the Charcot monument/claim, the rock is more granitic in composition. Rock surfaces show glacial polish and some glacial grooving. There are many protected bays and inlets in the vicinity, and visiting yachts are often encountered.

STATION(S): Abandoned Argentine research hut at Point Circumcision

FAUNA & FLORA:

Penguins & flying birds: Adelie penguins, blue-eyed shags, and south polar skuas are confirmed breeders. Apparently hybrid south polar Antarctic brown skuas have been observed, but hybrid, nesting pairs have not been noted.

Seals: None noted during Antarctic Site Inventory survey visits.

Moss beds/lichens/plants: Snow algae is extensive. As the snow cover erodes, patches of *Prasiola crispera*, crustose lichens *Xanthoria*, spp. and *Caloplaca*, spp., and cushion moss, spp. may be found. *Deschampsia* noted in vicinity of the gentoo RIDGE colony. Photo documentation of snow algae, *Caloplaca*, spp., and *Matadia tessellata*.

UNUSUAL FEATURES: The southernmost breeding colony of gentoo penguins.

SENSITIVITY FACTORS: Blue-eyed shag colonies at NEARSIDE and FARSIDE must be visited carefully, from rock perches to the south of the colonies; the views are excellent, but extensive early season snow cover and late-season guano- and mud-pools necessitate care in reaching these viewing perches.

HISTORICAL ARTEFACTS: On Megalestris Hill there is a claim with a plaque erected in 1909 by the second French Antarctic Expedition led by Capt. Jean-Baptiste Charcot. The British Antarctic Survey restored the plaque in 1958. The plaque is officially designated HSM 27. There is an abandoned Argentine hut at Point Circumcision and memorial crosses on surrounding hills for British Antarctic Survey personnel who have perished on or near this site.

SSSI/SSA: None

LANDING CHARACTERISTICS: Assuming an expedition itinerary through the Lemaire Channel, Petermann offers an excellent visitor landing just to the south. In addition to the southernmost breeding gentoos, the site is historically important because of Charcot's overwintering in 1909. Visitors will have excellent views of gentoo penguins, Adelie penguins, and blue-eyed shags, and the snow algae adds a beautiful red and green gloss to the snow cover; the snow cover may be extensive and last well into the summer. The most used Petermann Island landing site is at Port Circumcision, which is well protected (this is precisely where *Pourquis-pas* wintered) and where there is an unmanned, but stocked, Argentine refuge hut. The hut is off-limits to visitors. The NEARSIDE and FARSIDE shag colonies are separated by a melt stream which may or may not be flowing.

8) Almirante Brown Station, vicinity Paradise Bay, Northwest Peninsula, 62/36'S, 59/55'W

PHYSICAL DESCRIPTION: Almirante Brown is the small Argentine station located in Paradise Bay. The old research station is located on a point of land with steep sea cliffs at least 100 meters high on one side (adjacent to Paradise Bay), and the sheer face of a tide-water glacier on the other side, to the east. Several of the principal buildings are 10-30 meters above a small concrete pier, and damage from an extensive fire, more than a decade ago, is still evident. A small refuge east of the old base is where summering biologists now reside. There are a few gentoo penguin nests on the bedrock below the ruins of the main, derelict station building. The rock around the station, along the coast, and near the buildings is massive porphyritic andesite, which is extensively mineralized with green epidote along cracks and in inclusions. Nunataks rise through the surrounding glaciers. The bay is well protected and deep. Glaciers on the south end of the bay

calve regularly.

STATION(S): Almirante Brown Station, old Argentine research station

FAUNA & FLORA:

Penguins & flying birds: A few pairs of gentoo penguins nest underneath remnants of the burnt-out station, with snowy sheathbills often parading about, looking for spills of regurgitated food. The sheathbills also are seen commonly on the shag cliffs south of the station, and are presumed to be breeding. Blue-eyed shags, Antarctic terns, skuas, spp., and kelp gulls nest on the cliffs overlooking Paradise Bay, to the south of the station. The two large shag colonies south of the station are easily censused from a zodiac.

Seals: The station does not afford a good haul-out beach, but crabeater, Weddell, and occasionally leopard seals often are found resting on ice floes in the bay, or on ice ledges along the shoreline.

Moss beds/lichens/plants: Moss becomes exposed on the slopes and cliffs above the station as the summer progresses, as well as on the cliffs within and above the shag colonies south of the station. Crustose lichens *Xanthoria*, spp. and *Caloplaca*, spp. have been noted on the shag cliffs.

UNUSUAL FEATURES: None noted.

SENSITIVITY FACTORS: None noted.

HISTORICAL ARTEFACTS: The burnt remains of the old station have not been fully removed, but much trash and garbage has been removed in recent years.

SSSI/SSA: None noted.

LANDING CHARACTERISTICS: This is a favored location for zodiac tours into Paradise Bay, which is regularly full of ice and a prime locus for resting crabeater, Weddell, and occasionally leopard seals. On the nearby cliffs overlooking the bay to the south of the station, two blue-eyed shag colonies can be easily viewed by zodiac; late in the summer, juvenile shags often follow and swim with the zodiacs. The only possible shore landing is at the station itself. The base is located on the Antarctic mainland and gives tourists an opportunity to set foot on the continent itself. The 30-50 meter slope behind the station is snow-covered for most of the spring and summer, and affords visitors a chance to hike upward for spectacular views of Paradise Bay, and then, to do some downhill snow sliding.

9) Waterboat Point, Paradise Bay, Northwest Peninsula, 62/36'S, 59/55'W

PHYSICAL DESCRIPTION: This is the low, westernmost termination of the Peninsula between Paradise harbor and Andvord Bay on the west coast of Graham Land. It is the site of the Chilean Station, Gonzalez Videla. Waterboat Point is separated from the mainland by high water. The Belgian Antarctic Expedition of 1898 first surveyed the coast in this vicinity. This particular point was surveyed and named by T.W. Bagshawe and M.C. Lester who lived here in a waterboat from 1921-22, while conducting studies of the on-site penguins. The area where they worked is roped off and noted by historical markers. The station area is about 10-15 meters above sea level. The exposed face of a crevassed glacier lies just beyond the tombola – the causeway that connects the station area to the mainland at low tide. The area around the edges of Paradise Bay is ruggedly mountainous and mainly covered with glaciers and snow, leaving a few nunataks and cliffs exposed. There are coast-line exposures of bedrock at the edge of the snow cover. There is now well-developed beach visible along the present shoreline where bare bedrock is exposed at sea level below the snow and ice.

STATION(S): Chilean Station Gonzales Videla

FAUNA & FLORA:

Penguins & flying birds: Gentoo penguins, chinstrap penguins, and snowy sheathbills are confirmed breeders. Kelp gulls, skuas, spp., and blue-eyed shags also noted, but do not appear to nest immediately on site.

Seals: No seals observed during Antarctic Site Inventory site visits.

Moss beds/lichens/plants: Snow algae common on glacier front.

UNUSUAL FEATURES: None noted.

SENSITIVITY FACTORS: Restricted visitor space (the station is crowded with gentoos; on the mainland side, slippery, often guano- or mud-strewn rocks make for difficult footing).

HISTORICAL ARTEFACTS: On site is HSM 56, the hut in which the pioneering penguin biologists Bagshawe and Lester overwintered in 1921-22. The remains include the base of their waterboat, the roots of door posts, and an outline of the hut and extension; this two-man expedition was the smallest expedition to ever overwinter in Antarctica. Also nearby is HSM 30, a shelter erected in 1950 to honor Gabriel Gonzalez Videla, the first Head of State to visit Antarctica.

SSSI/SSA: None

LANDING CHARACTERISTICS: This is the site of the Chilean Station, Gonzalez Videla, which the Chileans have refurbished. Garbage and oil drums have been removed. Buildings have been repainted and open doors closed to prevent indoor nesting by gentoo penguins and blue-eyed shags. Gentoos swarm over the station grounds, which is located on a spit of land that extends from the mainland, but which is disconnected from the mainland at high tide. Visitors may access the station by utilizing the small, wooden loading dock on the north side of the station. The mainland landing area requires visitors to negotiate slippery, onshore rocks. The station area contains markers denoting the Bagshawe-Lester overwintering expedition, which worked here and produced the Peninsula's first rigorous censuses of breeding penguins. If there is low tide, it is possible to walk across the rocky tidal flats from the station to the continent side of the bay.

10) Paulet Island, Northeast Peninsula, 62/36'S, 59/55'W

PHYSICAL DESCRIPTION: A circular island, about 1.0 mile in diameter, lying 3 miles southeast of Dundee Island, off the northeast end of the Antarctic Peninsula. Paulet is the site of an enormous Adelie penguin colony. The island was discovered by Ross's British expedition (1839-43), and named by Ross for a captain in the Royal Navy. Paulet consists of a distinct volcanic cone, 1,158 feet high. The landing beach on the north side of the island contains rounded, mainly spherical boulders and pebbles of basalt and scoria. Well to the east of the landing beach is a memorial cross marking the grave of one of the members of the Nordenskjold expedition who died here, and the remains of the hut in which these explorers overwintered may be found above the landing beach. Beyond and above the hut is a substantial ovoid-shaped lake, several hundred feet long and about half that width, which appears to be in the crater of the old volcano. The ridge above the landing (upon which the remains of the hut are located) is made up entirely of rounded boulders, pebbles, and even bomb-shaped fragments. This ridge slopes up gently to a steeper hillside leading around the lake. There are many Adelies around the lake and on the elevated ridge between the lake and a basaltic stack northeast of the landing beach. This stack contains sheathbill and shag nests, and sits opposite a large shag colony that covers a steep ridge on an interior hillside. Beyond this rock stack is a flat terrace that forms an apron around the north and northeast side of the island. Enormous numbers of Adelies nest on this apron and on the ridges above. The ground surface consists of cinders and pebbles in a muddy, guano-rich soil. The steep ridge that houses the large shag colony is underlain by solid basalt. Angular slabs of thin cryoturbated (broken and churned by freezing and thawing) basalt are common, and were used by the Nordenskjold expedition members to build their emergency hut.

STATION(S): None

FAUNA & FLORA:

Penguins & flying birds: Adelie penguins, blue-eyed shags, and snowy sheathbills are confirmed breeders. Both snow and Wilson's storm-petrels commonly course the higher scree and are strongly suspected to be breeding. There is a noticeable paucity of skuas, spp.; none were found nesting and very few were observed harassing penguins. Kelp gulls also observed but it is unclear whether they actually nest on site.

Seals: Weddell seals have hauled-out on the site's landing beach, and leopard seals often may be found hunting offshore.

Moss beds/lichens/plants: *Xanthoria*, spp. may be found on exposed slopes.

UNUSUAL FEATURES: None noted.

SENSITIVITY FACTORS: Restricted visitor space along landing beach, especially after creche period when chicks begin reaching the beach. Scree slopes should be avoided because of nesting snow petrels and Wilson's storm-petrels.

HISTORICAL ARTEFACTS: On site is HSM 41, the stone hut built in February 1903 by C.A. Larsen, Norwegian captain of the wrecked vessel, *Antarctic*, of the Swedish Antarctic Expedition led by Otto Nordenskjold, and the grave of a member of that expedition.

SSSI/SSA: None

LANDING CHARACTERISTICS: This small island in the western Weddell Sea is normally the home to at least 60,000 breeding pairs of Adelie penguins. It is also the site of an historical hut and burial marker from the ill-fated Nordenskjold expedition. The landing site is on the north central side of the island, and access is often impeded by ice. Anchoring is generally impossible because of the fast flowing ice and currents. Leopard seals often lurk offshore of the landing site. In normal circumstances, Paulet presents a very major challenge; the Adelies are tightly grouped and often difficult to access, especially when the beach is caked with ice, or later in the breeding season when penguin chicks break creche and move to the beach. In the 1994-95 austral summer, Paulet experienced a site-wide Adelie breeding crash, with many dead chicks strewn about and relatively small numbers of undersized chicks gasping for food. Normally, in mid-summer, this site is awash in chicks, guano and mud. In the 1994-95 season, blue-eyed shags also failed. The causes for the abject breeding failures are unclear, although suspicions suggest krill stock fluctuations in the penguins' and shags' normal foraging areas or, because of "high ice" winter, the penguins and shags found Paulet difficult to reach and were much delayed in starting their breeding cycle.

11) Arctowski Station, vicinity King Geo. Island, South Shetland Islands, 62/36'S, 59/55'W

PHYSICAL DESCRIPTION: The station is named for Henryk Arctowski, the Polish geologist, oceanographer and meteorologist of the Belgian Antarctic expedition (1897-99). The research station lies on a flat, shingle peninsula flanked to the south by a bay-mouth bar enclosing a small lagoon. The beach is largely cobble and the bay-mouth bar is mainly rounded cobbles, but there is a black sand beach at lower water levels. From the head of the peninsula, marked by a towering rock of brown-weathering, basalt material, visitors may traverse this cobble beach, which is known as half Moon Beach, for almost 0.5 mile, to an elephant seal wallow at the boundary of SSSI 8. The beach is littered with whale bones. The ground around the station area is spongy and muddy, made up of rounded sand and pebbly materials. Directly behind the station is a large morainal ridge. This moraine has fragments of fossil woody-plant material, which appears to be *Nothofagus*, the genus of beech trees from Tierra del Fuego.

STATION(S): Poland's Arctowski Station

FAUNA & FLORA:

Penguins & flying birds: Confirmed breeders in the immediate station vicinity (but not within the confines of SSSI 8) include Antarctic brown skuas (and hybrid skua pairs), Wilson's and black-bellied storm petrels. Adelie, gentoo and chinstrap penguins, and kelp gulls nest within the SSSI. Blue-eyed shags nest at various locations in Admiralty Bay.

Seals: Weddell and southern elephant seals frequently haul-out on Half Moon Beach, and the elephant seal wallow at the end of Half Moon Beach builds in numbers as the summer progresses. In many seasons, Antarctic fur seals will haul-out on the moss and *Deschampsia* between the beach and the station.

Moss beds/lichens/plants: *Deschampsia* and cushion moss beds are found between Half Moon Beach and the station. There are many crustose lichens visible along the shore and especially in the environs of the SSSI. There are also extensive *Usnea*, spp. patches within the SSSI.

UNUSUAL FEATURES: None noted.

SENSITIVITY FACTORS: The boundary of SSSI 8 is at the end of the visitor walk on Half Moon Beach, is not specifically marked, and is easily encroached. Grass and moss near the landing beach should not be trampled.

HISTORICAL ARTEFACTS: In the moss-strewn hills above and to the south of the station is HSM 51, the grave of Wladzimirz Puchalski. He was an artist and producer of documentary film, and died in January 1979 while working at the station. The grave is marked by a tall iron cross. SSSI/SSA: SSSI 8, Point Thomas Site.

LANDING CHARACTERISTICS: Arctowski Station is the Polish research base located in Admiralty Bay, South Shetland Islands. The short, easily walked beach in "front" of the station is called Half Moon Beach, and extends for 0.5 mile to the northern boundary of the Point Thomas Site of Special Scientific Interest, SSSI 8; as a matter of geography, Point Thomas is located northwest of Arctowski Station and outside of the SSSI, at the opening to Ezcurra Inlet. The high cliffs extending toward Ezcurra Inlet contain many nesting skuas and storm-petrels and would be easily disturbed by visitor encroachment. Half Moon Beach is frequently visited by expedition vessel passengers (usually in conjunction with Station visits), and ends at an elephant seal wallow that abuts the SSSI boundary. Late each season, fur seals often are found on the *Deschampsia* and moss inland from the beach. Skuas also breed here, and the wet areas are totally off-limits to visitors. There are no colonies of penguins or seabirds along this stretch of Half Moon Beach. Skuas occasionally nest on the grassy plain inward of the landing site. As the summer progresses, a snow melt lake develops on this plain, which becomes a skua bathing spot. There is very little room for tourists between the SSSI boundary and the Station.

Source: Naveen, Ron. *Compendium of Antarctic Peninsula Visitor Sites, A Report to the Governments of the United States and the United Kingdom*. Oceanites, Inc., Chevy Chase, MD. November 1997.

*Appendix 5: Antarctic Specially Protected
Areas and Historic Monuments*

Appendix 5
Antarctic Specially Protected Area and Historic Monuments

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Appendix 5

Antarctic Specially Protected Areas and Historic Monuments

New classification system for area protection and management:¹ When Annex V of the Protocol on Environmental Protection to the Antarctic Treaty enters into force, Specially Protected Areas, Sites of Special Scientific Interest, and some historic sites will be combined into a single category of protected area, Antarctic Specially Protected Areas (ASPAs). An additional category, Antarctic Specially Managed Areas (ASMAs), will also be created for areas where activities pose risks of mutual interference or cumulative environmental impacts and sites of recognized historic value that do not require strictly controlled access. Entry into an ASPA will require a permit, while entry into ASMAs will not.

Specially Protected Areas:² Some areas of Antarctica have features that require special care. Specially Protected Areas were created to preserve particularly important ecological systems. A permit is required to enter these areas. Historically, only Sites of Special Scientific Interest were required to have management plans. Many Specially Protected Areas now have existing management plans or management plans under development. Once in place, adherence to management plans is required. Specially Protected Areas were designated under Article VIII of the Agreed Measures for the Conservation of Antarctic Fauna and Flora. Since the Agreed Measures were written, sites have been added or changed.

Sites of Special Scientific Interest:³ Sites of Special Scientific Interest were developed to protect scientific investigations in the Antarctic. Like Specially Protected Areas, Sites of Special Scientific Interest require special provisions and management plans to prevent the disturbance of investigations. Nearly all these sites require permits for entry and/or activity.

Historic Monuments:⁴ Just as the ecosystems of Antarctica are important, so also is Antarctica's exploration and development. It was decided at the first Antarctic Treaty consultative meeting to protect artifacts and areas that commemorate Antarctica's exploration. At the 5th consultative meeting it was agreed that lists of historic monuments and sites would be created. Since that meeting, lists have been consolidated into one list that has been updated periodically. The monument areas have special provisions to ensure their protection.

¹ National Science Foundation "Antarctic Conservation Act of 1978 (Public Law 95-541) with Regulations, Descriptions and Maps of Special Areas, Permit Application Form, Agreed Measures for the Conservation of Antarctic Fauna and Flora (1964), Protocol on Environmental Protection (1991)." October 1995.

² National Science Foundation, October 1995.

³ National Science Foundation, October 1995.

⁴ National Science Foundation, October 1995.

Antarctic Specially Protected Areas⁵

In 1998, U.S. legislation implementing the Environmental Protocol combined areas previously designated as Specially Protected Areas and Sites of Special Scientific Interest into a single category of Antarctic Specially Protected Areas (ASPAs). These are defined as an area designated by the Antarctic Treaty Parties to protect outstanding environmental, scientific, historic, aesthetic, or wilderness values or to protect ongoing or planned scientific research, and are designated in the following list.

ASPA 101	Taylor Rookery, MacRobertson Land
ASPA 102	Rookery Islands, Holme Bay
ASPA 103	Ardrey Island and Odber Island, Budd Coast
ASPA 104	Sabrina Island, Balleny Islands
ASPA 105	Beaufort Island, Ross Sea
ASPA 106	Cape Hallett, Victoria Land
ASPA 107	Dion Islands, Marguerite Bay, Antarctic Peninsula
ASPA 108	Green Island, Berthelot Islands, Antarctic Peninsula
ASPA 109	Moe Island, South Orkney Islands
ASPA 110	Lynch Island, South Orkney Islands
ASPA 111	Southern Powell Island and adjacent islands, South Orkney Islands
ASPA 112	Coppermine Peninsula, Robert Island
ASPA 113	Litchfield Island, Arthur Harbor, Palmer Archipelago
ASPA 114	North Coronation Island, South Orkney Islands
ASPA 115	Lagotellerie Island, Marguerite Bay
ASPA 116	New College Valley, Caughley Beach, Cape Bird, Ross Island
ASPA 117	Avian Island, Northwest Marguerite Bay
ASPA 118	Cryptogam Ridge, Mount Melbourne, Victoria Land
ASPA 119	Forlidas Pond and Davis Valley Ponds
ASPA 120	Pointe-Geologie Archipelago
ASPA 121	Cape Royds, Ross Island
ASPA 122	Arrival Heights, Hut Point Peninsula, Ross Island
ASPA 123	Barwick Valley, Victoria Land
ASPA 124	Cape Crozier, Ross Island
ASPA 125	Fildes Peninsula, King George Island, South Shetland Islands
ASPA 126	Byers Peninsula, Livingston Island, South Shetland Islands
ASPA 127	Haswell Island
ASPA 128	Western Shore of Admiralty Bay, King George Island
ASPA 129	Rothera Point, Adelaide Island
ASPA 130	Tramway Ridge, Mt. Erebus, Ross Island
ASPA 131	Canada Glacier, Lake Fryxell, Taylor Valley, Victoria Land
ASPA 132	Potter Peninsula, King Georgia Island, South Shetland Island
ASPA 133	Harmony Point
ASPA 134	Cierva Point and nearby islands, Danco Coast, Antarctic Peninsula
ASPA 135	Bailey Peninsula, Budd Coast, Wilkes Land

⁵ Revised regulations by the National Science Foundation to implement the Protocol's revised nomenclature of protected areas. In: 45 CFR Part 670.

ASPA 136	Clark Peninsula, Budd Coast, Wilkes Land
ASPA 137	Northwest White Island, McMurdo Sound
ASPA 138	Linnaeus Terrace, Asquard Range, Victoria Land
ASPA 139	Biscoe Point, Anvers Island, Palmer Archipelago
ASPA 140	Shores of Port Foster, Deception Island, South Shetland Islands
ASPA 141	Yukidori Valley, Langhovde, Lutzow-Holm Bay
ASPA 142	Svarthamaren Mountain, Muhlig-Hofmann Mountains, Queen Maud Land
ASPA 143	Marine Plain, Mule Peninsula, Vestfold Hills, Princess Elizabeth Land
ASPA 144	Chile Bay (Discovery Bay), Greenwich Island, South Shetland Islands
ASPA 145	Port Foster, Deception Island, South Shetland Islands
ASPA 146	South Bay, Doumer Island, Palmer Archipelago
ASPA 147	Ablation Point-Ganymede Heights, Alexander Island
ASPA 148	Mount Flora, Hope Bay, Antarctic Peninsula
ASPA 149	Cape Shirreff, Livingston Island, South Shetland Islands
ASPA 150	Ardley Island, Maxwell Bay, King George Island, South Shetland Islands
ASPA 151	Lions Rump, King George Island, South Shetlands Islands
ASPA 152	Western Bransfield Strait, off Low Island, South Shetland Islands
ASPA 153	East Dallmann Bay, off Brabant Island
ASPA 154	Cape Evans Historic Site
ASPA 155	Lewis Bay Tomb

Historic Monuments in Antarctica⁶

The need to protect historic monuments and sites became apparent as the number of expeditions to the Antarctic increased. At the Seventh Antarctic Treaty Consultative Meeting it was agreed that a list of historic monuments and sites be created. So far 60 sites have been identified. All of them are monuments — human artifacts rather than sites or areas — and, many of them are in close proximity to scientific stations. Provision for protection of these sites is contained in Annex V, Article 8, on the grounds that the Antarctic Specially Protected Area permit system is the best means of ensuring protection of historic monuments where direct oversight is not possible.

List of Historic Monuments Identified and Described by the Proposing Government or Governments

- (1) *Flag mast* erected in December 1965 at the South Geographical Pole by the First Argentine Overland Polar Expedition.
- (2) *Rock cairn and plaques* at Syowa station (69°00' S. 39°35' E.) in memory of Shin Fukushima, a member of the 4th Japanese Antarctic Research Expedition, who died in October 1960 while performing official duties. The cairn was erected on January 11, 1961 by his colleagues. Some of his ashes repose in the cairn.
- (3) *Rock cairn and plaque* on Proclamation Island, Enderby Land, erected in January 1930 by Sir Douglas Mawson. The cairn and plaque (65°51' S. 53°41' E.) commemorate the landing on Proclamation Island of Sir Douglas Mawson with a party from the British, Australian, and New Zealand Antarctic Research Expedition of 1929-31.
- (4) *Station building* to which a bust of V.I. Lenin is fixed, together with a plaque in memory of the conquest of the Pole of Inaccessibility by Soviet Antarctic explorers in 1958 (83°06' S. 54°58' E.).
- (5) *Rock cairn and plaque* at Cape Bruce, Mac. Robertson Land, erected in February 1931 by Sir Douglas Mawson. The cairn and plaque (67°25' S. 60°47' E.) commemorate the landing on Cape Bruce of Sir Douglas Mawson with a party from the British, Australian, and New Zealand Antarctic Research Expedition of 1929-31.
- (6) *Rock cairn* at Walkabout Rocks, Vestfold Hills, "Princess Elizabeth Land," erected in 1939 by Sir Hubert Wilkins. The cairn (68°22' S. 78°33' E.) houses a canister containing a record of his visit.
- (7) *Stone with inscribed plaque*, erected at Mirny Observatory (66°33' S. 93°01' E.), Mabus Point, in memory of driver-mechanic Ivan Khmara, who perished on fast ice in the performance of official duties in 1956.
- (8) *Metal monument-sledge* at Mirny Observatory (66°33' S. 93°01' E.), Mabus Point, with plaque in memory of driver-mechanic Anatoly Shcheglov, who perished in the performance of official duties.

⁶ Excerpted from: *Antarctic Conservation Act of 1978 (Public Law 95-541) with Regulations, Descriptions and Maps of Special Areas, Permit Application Form, Agreed Measures for the Conservation of Antarctic Fauna and Flora (1964), and Protocol on Environmental Protection (1991)*. National Science Foundation. Arlington, VA. October 1995.

(9) *Cemetery* on Buromskiy Island (66°32' S. 93°01' E.), near Mirny Observatory, in which are buried Soviet, Czechoslovak, and German Democratic Republic citizens, members of Soviet Antarctic Expeditions, who perished in the performance of official duties on August 3, 1960.

(10) *Building (magnetic observatory)* at Dobrowolsky station (66°16' S. 100°45' E.), Bunger Hills, with plaque in memory of the opening of Oasis station in 1956.

(11) *Heavy tractor* at Vostok station (78°28' S. 106°48' E.) with plaque in memory of the opening of the station in 1957.

(12) *Cross and plaque* at Cape Denison (67°00' S. 142°42' E.), George V Land, erected in 1913 by Sir Douglas Mawson on a hill situated 300 meters west by south, from the main hut of the Australasian Antarctic Expedition of 1911-14. The cross and plaque commemorate Lieutenant B.E.S. Ninnis and Dr. X. Mertz, members of the expedition, who died in 1913 while engaged in the work of the expedition.

(13) *Hut* at Cape Denison (67°00' S. 142°42' E.), George V Land, built in January 1912 by Sir Douglas Mawson for the Australasian Antarctic Expedition of 1911-14. This was the main base of the expedition.

(14) *Remains of rock shelter* at Inexpressible Island (74°54' S. 163°43' E.), Terra Nova Bay, constructed in March 1912 by Victor Campbell's Northern Party, British Antarctic Expedition, 1910-13. The party spent the winter of 1912 in this shelter and a nearby ice cave.

(15) *Hut* at Cape Royds (77°38' S. 166°07' E.), Ross Island, built in February 1908 by Ernest Shackleton. The hut was restored in January 1961 by Antarctic Division of New Zealand Department of Scientific and Industrial Research.

(16) *Hut* at Cape Evans (77°38' S. 166°24' E.), Ross Island, built in January 1911 by Captain Robert Falcon Scott. The hut was restored in January 1961 by Antarctic Division of New Zealand Department of Scientific and Industrial Research.

(17) *Cross* on Wind Vane Hill (77°38' S. 166°24' E.), Cape Evans, Ross Island, erected by the Ross Sea Party of Ernest Shackleton's Trans-Antarctic Expedition, 1914-16, in memory of three members of the party who died in the vicinity in 1916.

(18) *Hut* at Hut Point. (77°51' S. 166°37' E.), Ross Island, built in February 1902 by Captain Robert Falcon Scott. The hut was partially restored in January 1964 by the New Zealand Antarctic Society, with assistance from the U.S. Government.

(19) *Cross* at Hut Point (77°51' S. 166°37' E.), Ross Island, erected in February 1904 by the British Antarctic Expedition, 1901-04, in memory of T. Vince, a member of that expedition who died in the vicinity.

(20) *Cross* on Observation Hill (77°51' S. 166°40' E.), Ross Island, erected in January 1913 by the British Antarctic Expedition, 1910-13, in memory of Captain Robert Falcon Scott's party, which perished on the return journey from the South Pole, March 1912.

- (21) *Stone hut* at Cape Crozier (77°32' S. 169°18' E.), Ross Island, constructed in July 1911 by Edward Wilson's party (British Antarctic Expedition, 1910-13) during the winter journey to collect emperor penguin eggs.
- (22) *Hut* at Cape Adare (71°17' S. 170°15' E.) built in February 1899 during *Southern Cross* expedition led by C.E. Borchgrevink. There are three huts at Cape Adare: two date from Borchgrevink's expedition and one from Scott's Northern Party, 1910-11. Only the southernmost Borchgrevink hut survives in a reasonable state of repair.
- (23) *Grave* at Cape Adare (71°17' S. 170°15' E.) of Norwegian biologist Nicolai Hanson, a member of C.E. Borchgrevink's *Southern Cross* expedition, 1899-1900. This is the first known grave in the Antarctic.
- (24) *Rock cairn*, known as "Amundsen's Cairn," on Mount Betty (85°11' S. 163°45' W.), Queen Maud Range. This was erected by Roald Amundsen on January 6, 1912 on his way back to Framheim from the South Pole.
- (25) *Hut and plaque* on Peter I Oy, built by the Norwegian Captain Nils Larsen in February 1929 at Framnaesodden (68°47' S. 90°42' W.). The plaque is inscribed "Norvegia-ekspedisjonen 2/2 1929."
- (26) *Abandoned installations of Argentine station* General San Martin on Barry Island (68°08' S. 67°08' W.), Debenham Islands, Marguerite Bay, with cross, flag mast, and monolith built in 1951.
- (27) *Cairn with plaque* on Megalestris Hill (65°10' S. 64°10' W.), Petermann Island, erected in 1909 by the second French expedition led by J.B. Charcot. It was restored by the British Antarctic Survey in 1958.
- (28) *Rock cairn* at Port Charcot (65°03' S. 64°01' W.), Booth Island, with wooden pillar and plaque inscribed with the names of the first French expedition led by J.B. Charcot, who wintered here in 1903 aboard *Le Francais*.
- (29) *Lighthouse* named "Primero de Mayo" erected on Lambda Island (64°18' S. 62°59' W.), Melchior Islands, by Argentina in 1942. This was the first Argentine lighthouse in the Antarctic.
- (30) *Shelter* at Paradise Harbor (64°49' S. 62°51' W.) erected in 1950 near the Chilean Base Gabriel González Videla to honor Gabriel González Videla, the first Head of State to visit the Antarctic.
- (31) *Memorial plaque* marking the position of a cemetery on Deception Island (62°59' S. 60°34' W.), where some 40 Norwegian whalers were buried in the first half of the twentieth century. The cemetery was swept away by a volcanic eruption in February 1969.
- (32) *Concrete monolith* erected in 1947 near Arturo Prat Base on Greenwich Island (62°29' S. 59°40' W.). This monolith served as the point of reference for Chilean Antarctic hydrographic work.
- (33) *Shelter and cross with plaque* near Arturo Prat Base, Greenwich Island (62°30' S. 59°41' W.). The shelter was named in memory of Lieutenant-Commander González Pacheco, who died tragically while in charge of the station in 1960.
- (34) *Bust* of the Chilean naval hero Arturo Prat erected in 1947 at the base of the same name on Greenwich Island (62°30' S. 59°41' W.).

(35) *Wooden cross and statue* of the Virgin of Carmen erected in 1947 near Arturo Prat Base on Greenwich Island (62°30' S. 59°41' W.). There is also nearby a metal plaque of the Lions International Club.

(36) *Metal plaque* at Potter Cove (62°13' S. 58°42' W.), King George Island, erected by Eduard Dallmann to commemorate the visit of his German expedition on March 1, 1874.

(37) *Statue of Bernardo O'Higgins*, erected in 1948 in front of the station of the same name (63°19' S. 57°54' W.) to honor the first ruler of Chile to envision the importance of Antarctica.

(38) *Hut* on Snow Hill Island (64°24' S. 57°00' W.) built in February 1902 by the main party of the Swedish South Polar Expedition, led by Otto Nordenskjöld.

(39) *Stone hut* at Hope Bay (63°24' S. 56°59' W) built in January 1903 by a party of the Swedish South Polar Expedition.

(40) *Bust of General San Martin, grotto with a statue of the Virgin of Lujan, and a flag mast* at "Base Esperanza" (63°24' S. 56°59' W.), Hope Bay, erected by Argentina in 1955; together with a graveyard with stele in memory of members of Argentine expeditions who died in the area.

(41) *Stone hut* on Paulet Island (63°35' S. 55°47' W.) built in February 1903 by C.A. Larsen, Norwegian captain of the wrecked vessel *Antarctic* of the Swedish South Polar Expedition led by Otto Nordenskjöld, together with the grave of a member of that expedition.

(42) *Area at Scotia Bay*, Laurie Island (60°46' S. 44°40' W.), South Orkney Islands, in which are found a stone hut built in 1903 by the Scottish Expedition led by W.S. Bruce; the Argentine Meteorological and Magnetic Observatory, built in 1905; and a graveyard with seven tombs dating from 1903.

(43) *Cross* erected in 1955, at a distance of 1300 meters northeast of the Argentine Base General Belgrano at "Piedrabuena Bay," Filchner Ice Shelf (77°49' S. 38°02' W.).

(44) *Plaque* erected at the temporary Indian station Dakshin Gangotri, Princess Astrid Coast (70°45' S. 11°38' E.), Queen Maud Land, listing the names of the members of the First Indian Antarctic Expedition, which landed nearby on January 9, 1982.

(45) *Plaque* on Brabant Island, on Metchnikoff Point (64°02' S. 62°34' W.), mounted at a height of 70 meters on the crest of the moraine separating this point from the glacier and bearing the following inscription: "This monument was built by Francois de Gerlache and other members of the joint services expedition 1983-85 to commemorate the first landing on Brabant Island by the Belgian Antarctic Expedition 1897-99:

Adrien de Gerlache (Belgium) leader
Roald Amundsen (Norway)
Henryk Arctowski (Poland)
Frederick Cook (United States) and
Emile Danco (Belgium)

camped nearby from 30 January to 6 February 1898."

(46) *All the buildings and installations of Port Martin base* (66°49' S. 141°24' E.), Terre Adélie, constructed in 1950 by the 3rd French expedition and partly destroyed by fire the night of January 23-24, 1952.

(47) *Wooden building* called Base Marret on the Ile des Petrels off Terre Adélie (66°40' S. 140°01' E.) where seven men under the command of Mario Marret wintered in 1952 following the fire at Port Martin base.

(48) *Cross* erected on the northeast headland of the Ile des Petrels (66°40' S. 140°01' E.), Terre Adélie, in memory of Andre Prudhomme, head meteorologist in the 3rd International Geophysical Year expedition, who disappeared during a storm on January 7, 1959.

(49) *Concrete pillar* erected by the First Polish Antarctic Expedition at Dobrowolski station on the Bunger Hills (66°16.3' S. 100°45' E., h = 35.4 meters) to measure acceleration due to gravity $g = 982,349.4$ milligals, plus or minus 0.4 milligals in relation to Warsaw, according to the Potsdam system, in January 1959.

(50) *Plaque* bearing the Polish eagle, the national emblem of Poland, the dates 1975 and 1976, and this text in Polish, English, and Russian: "In memory of the landing of members of the first Polish Antarctic marine research expedition on the vessels *Professor Siedlecki* and *Tazar* in February 1976." The plaque is on a shore cliff on Fildes Peninsula, King George Island, Maxwell Bay, southwest of the Chilean and Russian stations.

(51) *Grave* of Wladzimirz Puchalski, surmounted by an iron cross, on a hill to the south of Arctowski station on King George Island. W. Puchalski was an artist, a producer of documentary nature films, who died on January 19, 1979 whilst working at the station.

(52) *Monolith* erected to commemorate the establishment on February 20, 1985, by the People's Republic of China of the Great Wall station (62°13' S. 58°58' W.) on Fildes Peninsula, King George Island, in the South Shetland Islands. Engraved on the monolith is this inscription in Chinese: "Great Wall Station, First Chinese Antarctic Research Expedition, 20 February 1985."

(53) *Monolith and commemorative plaques* celebrating the rescue of survivors of the British ship *Endurance* by the Chilean Navy cutter *Yelcho* displaying the following words:

"Here, on 30 August 1916, the Chilean Navy cutter *Yelcho*, commanded by Pilot Luis Pardo Villalon, rescued the 22 men from the Shackleton Expedition who survived the wreck of the *Endurance* living for four and one half months in this Island."

The monolith and the plaques have been placed on Elephant Island (61°03' S. 54°50' W.) and their replicas on the Chilean bases Arturo Prat (62°30' S. 59°49' W.) and Lieutenant Rodolfo Marsh (62°12' S. 62°12' W.). Bronze busts of the pilot Luis Pardo Villalon were placed on the three above-mentioned monoliths during the XXIVth Chilean Antarctic Scientific Expedition in 1987-1988.

(54) *Richard E. Byrd Historic Monument*, McMurdo station (77°51' S. 166°40' E.). A bronze bust on black marble, the monument stands 1.55 meters high by 0.625 meter square, on a wood platform, and bears inscriptions describing the polar achievements of Richard Evelyn Byrd. The monument was erected at McMurdo station in 1965.

(55) *East Base*, Stonington Island (68°11' S. 67°00' W.); buildings and artifacts and their immediate environs. These structures were erected and used during two U.S. wintering expeditions: the Antarctic Service Expedition (1939-1941) and the Ronne Antarctic Research Expedition (1947-1948). The historic area is 1000 meters in the north-south direction (from the beach to Northeast Glacier adjacent to Back Bay) and 500 meters in the east-west direction.

(56) *Waterboat Point*, Danco Coast, Antarctic Peninsula (64°49' S. 62°52' W.); the remains and immediate environs of the Waterboat Point hut, situated close to the unoccupied Chilean station, Presidente Gabriel González Videla. The Waterboat Point hut, of which only the base of the boat, roots of door posts, and an outline of the hut and extension still exist, was occupied by the United Kingdom two-man expedition of Bagshawe and Lester in 1921-1922. This was, and indeed remains, the smallest expedition to ever overwinter in Antarctica.

(57) *Commemorative plaque* at Yankee Harbor, McFarlane Strait, Greenwich Island, South Shetland Islands, near the Chilean refuge located at latitude 62°32' S. longitude 59°45' W., to the memory of Captain Robert McFarlane, who in 1820 explored the Antarctic Peninsula Area in the brigantine *Dragón*.

(58) *Cairn* with memorial plaque erected at Whalers Bay, Deception Island, South Shetland Islands, in the vicinity of the whalers' cemetery (historic monument number 31, 62°59' S. 60°34' W.), to honor captain Adolfus Amandus Andresen, antarctic pioneer who was first to establish a whaling operation at Deception Island in 1906.

(59) *Cairn* on Half Moon Beach, Cape Shirreff, Livingston Island, South Shetland Islands, commemorating the officers, soldiers, and seamen on board the *San Telmo*, which sank in September 1819; possibly the first people to live and die in the wastes of the Antarctic.

(60) *Wooden plaque and rock cairn*, southern coast of Seymour Island (64°16' S. 56°39' 10" W.). On November 10, 1903, the rescue crew of the Argentine corvette *Uruguay* placed the plaque where they met members of the Swedish expedition led by Dr. Otto Nordenskjöld. The plaque reads: "10.XI.1903 'Uruguay' (Argentine Navy) in its journey to give assistance to the Swedish Antarctic Expedition." In January 1990 Argentina erected the rock cairn in memory of the event.

This list was developed at Antarctic Treaty Consultative Meetings VII, XII, XIII, XIV, XV, XVI, and XVII.

***Appendix 6: U.S. Antarctic Program:
Research Stations, Summer Field Camps
and Other Temporary Facilities, Support
Ships and Aircraft, and Research Activities
of U.S. Federal Government Agencies***

Appendix 6
U.S. Antarctic Program:
Research Stations, Summer Field Camps and Other Temporary Facilities,
Support Ships and Aircraft, and Research Activities of U.S. Federal
Government Agencies

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Appendix 6
U.S. Antarctic Program:
Research Stations, Summer Field Camps and Other Temporary Facilities,
Support Ships and Aircraft, and Research Activities of U.S. Federal
Government Agencies

Table 6.1. Research Stations	
Location	Description
McMurdo Station 77°51'S 166°40'E Hut Point Peninsula on Ross Island	<u>ESTABLISHED</u> : 1955
	<u>FACILITIES</u> : Harbor, landing strips on sea ice and shelf ice, and a helicopter pad; 85 or so buildings range in size from a small radio shack to large, three-story structures
	<u>RESEARCH</u> : Marine and terrestrial biology, biomedicine, geology and geophysics, glaciology and glacial geology, meteorology, aeronomy, and upper atmospheric physics
	<u>STATION POPULATION</u> : Largest Antarctic station with a peak summer population capacity of 1,258 and a winter population of approximately 200
	<u>NOTABLE FUNCTION(S)</u> : Logistics hub of the USAP; air transportation to New Zealand is frequent between October and February, but the winter population is isolated from late February to late August
	<u>NOTABLE FEATURES</u> : Hut Point Peninsula on Ross Island is the most southerly solid ground accessible by ship and is located just 20 miles south of Mt. Erebus, an active volcano that steams continually and erupts frequently though not violently
Amundsen-Scott Station 90°S South Pole	<u>ESTABLISHED</u> : Continuous occupation by Americans since 1956
	<u>FACILITIES</u> : Central geodesic dome with attachments to the fuel supply, power house, a medical facility, and other functions; detached buildings house research instruments, and a summer camp serves as an emergency camp during the winter should the principal facilities be lost
	<u>RESEARCH</u> : Glaciology, geophysics, meteorology, upper atmosphere physics, astronomy, astrophysics, and biomedical studies
	<u>STATION POPULATION</u> : Peak summer capacity of 173; the 1996 winter population was only 27. The Station's winter personnel are isolated between mid-February and late October.
	<u>NOTABLE FUNCTION(S)</u> :
	<u>NOTABLE FEATURES</u> : Station is located on interior's nearly featureless ice sheet at the geographic South Pole

Palmer Station 64.46'S 64.03'W Anvers Island immediately west of the Antarctic Peninsula	<u>ESTABLISHED</u> : 1965
	<u>FACILITIES</u> : Two major buildings (including sea water aquaria), three small buildings, two large fuel tanks, a helicopter pad, and a dock
	<u>RESEARCH</u> : Biological studies of birds, seals and other components of the marine ecosystem, meteorology, upper atmosphere physics, glaciology, and geology; designated as a long-term ecological research site
	<u>STATION POPULATION</u> : Peak summer population capacity is 43; the 1996 winter population was 20
	<u>NOTABLE FUNCTION(S)</u> : An ice-strengthened ship can transit, generally across the Drake Passage from South America, any month of the year, thus the Station is not isolated in the winter as are McMurdo and the South Pole
	<u>NOTABLE FEATURES</u> : Located on Anvers Island immediately west of the Antarctic Peninsula, this is the only U.S. station north of the Antarctic Circle; Station sets on a protected harbor

Source: USAP External Panel (1997), NSF Facts About the U.S. Antarctic Program (1994)

Table 6.2. Summer Field Camps and Other Temporary Facilities	
Type of Facility	Description
Field Camps	<u>ESTABLISHED</u> : Approximately 30 established each austral summer to support specific projects
	<u>PURPOSE</u> : Geology, geophysics, glacial geology, glaciology, and terrestrial biology have been pursued at these camps which often have significant international involvement
	<u>CONSTRUCTION</u> : Typically consist of Jamesways (quickly erected structures made of canvas and wood)
	<u>TRANSPORTATION/SUPPLY</u> : Helicopters or Twin Otter airplanes provide transportation and support along with motor toboggans
	<u>PERSONNEL HOUSED</u> : Support a population of 40-60 during the November-January period
Huts	<u>ESTABLISHED</u> : Erected for summer research projects expected to continue over several seasons at the same location
	<u>PURPOSE</u> : Used in recent years in Taylor Valley (an ice-free, dry valley in southern Victoria Land) for study of lake ecosystems, at Cape Crozier on Ross Island for population and behavioral studies of penguin rookeries, and near the summit of Mt. Erebus for volcanology
	<u>CONSTRUCTION</u> : Last for several years providing space, stable work areas, and comfort not achievable with tents or Jamesways
	<u>TRANSPORTATION/SUPPLY</u> : Helicopter or tracked vehicle from McMurdo Station

	<u>PERSONNEL HOUSED</u> : Small parties requiring temporary shelter over several seasons at the same location
Tents	<u>ESTABLISHED</u> : Temporary single- or double-walled shelter tents
	<u>PURPOSE</u> : Temporary shelter that is stable in high winds and can be erected quickly; extended backpacking trips generally are not practical in Antarctica due to the weight of the equipment and the fuel required to melt ice for water, to cook, and to combat the cold
	<u>CONSTRUCTION</u> : Temporary shelter tents; cold-weather sleeping bags used on ground cushions with cooking on portable stoves
	<u>TRANSPORTATION/SUPPLY</u> : Usually placed or moved by helicopter or motor toboggan
	<u>PERSONNEL HOUSED</u> : Small parties requiring temporary shelter

Source: USAP External Panel (1997), NSF Facts About the U.S. Antarctic Program (1994)

Table 6.3. Support Ships and Aircraft	
Operator	Craft and Function
NSF	<u>SHIP</u> : <i>R/V Laurence M. Gould</i> ; ABS - A1 ice breaker
	<u>FUNCTION</u> : Performs research and research support often in collaboration with Palmer Station. Research includes biological, oceanographic, geological, and geophysical studies; crew of 14 and up to 28 scientists
	<u>SHIP</u> : <i>R/V Nathaniel B. Palmer</i> ; ABS-A2 ice breaker
	<u>FUNCTION</u> : Performs research and research support in the Southern Ocean. Research includes biological, oceanographic, geological and geophysical studies. Crew of 22 and up to 39 scientists
U.S. Coast Guard ¹	<u>SHIP</u> : Polar-class icebreaker
	<u>FUNCTION</u> : Operates annually in the Antarctic to provide logistical support and break channels through McMurdo sound
Military Sealift Command	<u>SHIP</u> : Ice-strengthened tanker
	<u>FUNCTION</u> : Delivers approximately six million gallons of fuel to McMurdo Station
Military Sealift Command	<u>SHIP</u> : Ice-strengthened container ship
	<u>FUNCTION</u> : Delivers most of the cargo used at McMurdo and inland stations and takes waste to the U.S. for recycling or disposal.
Air National Guard	<u>AIRCRAFT</u> : Seven LC-130 Hercules four-engine turboprop transports with ski-equipped landing gear for snow and ice

¹ The U.S. Coast Guard fueling and container ships are operated under contract to the Military Sealift Command.

	FUNCTION: Provide transportation within Antarctica and air service between McMurdo and New Zealand
Commercial Operator	AIRCRAFT: Four commercial helicopters; ski-fitted deHavilland Twin Otter turboprop airplanes. (The payload and range of a Twin Otter are substantially less than those of the LC-130 but greater than those of the helicopters.)
	FUNCTION: Support operations at McMurdo Station

Source: USAP External Panel (1997), NSF Facts About the U.S. Antarctic Program (1994)

Table 6.4. Research Activities of U.S. Federal Government Agencies	
The scientific research of other federal agencies is coordinated by the National Science Foundation as part of the U.S. Antarctic Program. Research by federal agencies may include the following:	
National Aeronautics and Space Administration (NASA):	suborbital studies of cosmic radiation and the Sun, study and archiving of meteorites, microbial studies with extraterrestrial applications, sea ice and ice sheet studies, stratospheric measurements related to ozone, a synthetic-aperture radar ground station, technology development (e.g., a food growth and waste recycling system for South Pole Station), and human factors including isolation and confinement and other analog studies
National Oceanic and Atmospheric Administration (NOAA):	climate monitoring, ozone studies, remote sensing (e.g., sea surface temperature, atmospheric temperature, cloud imagery), sea ice and iceberg analyses, and marine living resources research
U.S. Geological Survey (USGS):	mapping, geology, geophysics, glaciology, and long-term ecological monitoring
Department of Energy (DOE) and the Smithsonian Center for Astrophysics:	astrophysics

Source: USAP External Panel (1997)

*Appendix 7: International Association of
Antarctica Tour Operators (IAATO):
Member Objectives, Membership Categories
and Criteria, Membership as of May 2001,
and Bylaws*

Appendix 7
International Association of Antarctica Tour Operators (IAATO):
Member Objectives, Membership Categories and Criteria, Membership
as of May 2001, and Bylaws

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Appendix 7
International Association of Antarctica Tour Operators (IAATO):
Member Objectives, Membership Categories and Criteria,
Membership as of May 2001, and Bylaws

Member Objectives¹

- To represent Antarctic tour operators and others organizing and conducting travel to the Antarctic, to the Antarctic Treaty Parties, the International conservation community and the public at large.
- To advocate, promote and practice safe and environmentally responsible travel to the Antarctic.
- To circulate, promote and follow the *Guidance for Visitors to the Antarctic* and *Guidance for Those Organising and Conducting Tourism and Non-governmental Activities in the Antarctic*, as adopted by the Antarctic Treaty System (Recommendation XVIII-1).
- To operate within the parameters of the Antarctic Treaty System, including the Antarctic Treaty and the Protocol on Environmental Protection to the Antarctic Treaty, along with MARPOL, SOLAS and similar international and national laws and agreements.
- To foster continued cooperation among its members; to monitor IAATO programs, including the pattern and frequency of visits to specific sites within the Antarctic; and to coordinate itineraries so that no more than 100 people are ashore at any one time in any one place.
- To provide a forum for the international, private-sector travel industry to share their expertise and opinions; and to uphold the highest standards.
- To enhance public awareness and concern for the conservation of the Antarctic environment and its associated ecosystems and to better inform the media, governments and environmental organizations about private-sector travel to these regions.
- To create a corps of ambassadors for the continued protection of Antarctica by offering the opportunity to experience the continent first hand.
- To support science in Antarctica through cooperation with national Antarctic programs, including logistical support and research; and to foster cooperation between private-sector travel and the international scientific community in Antarctica.
- To ensure that the best qualified staff and field personnel are employed by IAATO members through continued training and education; and to encourage and develop international acceptance of evaluation, certification and accreditation programs for Antarctic personnel.

Membership Categories and Criteria²

Full Members: Experienced organizers that operate travel programs to the Antarctic and who: a) pledge to abide by IAATO Bylaws; b) agree not to carry more than 400 passengers per trip and to not have more than 100 passengers ashore at any one site at the same time; c) have been formally accepted by two-thirds of the standing members after review and fulfill any other requirements for membership.

Provisional Members: Organizers that operate travel programs to the Antarctic that are requesting membership in IAATO. Provisional Members must: a) pledge to abide by IAATO Bylaws; b) agree not to carry more than 400 passengers per trip and to not have more than 100 passengers ashore at any one site at the same time; c) be formally accepted by two-thirds of the standing members after review and fulfill any other requirements for membership; and d) agree to carry an IAATO-approved Observer aboard on a voyage during the season and to forward the full observer report to the Secretariat. Provisional Members must have

¹IAATO Bylaws 2001

²IAATO Bylaws 2001

an Observer designated by an appropriate National Antarctic Program during their first season of Antarctic operations. If none is available, IAATO will designate a qualified observer with reasonable compensation provided by the operator. A full observer report must be forwarded to the Secretariat following the conclusion of the voyage.

Probationary Members: Current or past Full Members who have not fully complied with IAATO by-laws or who otherwise are not in good standing as decided by a two-thirds vote of the full members. Probationary members must a) pledge to abide by IAATO Bylaws; b) agree not to carry more than 400 passengers per trip and to not have more than 100 passengers ashore at any one site at the same time; and c) agree to carry an IAATO-approved observer aboard for a voyage during the season and to forward the full Observer report to the Secretariat. Probationary Members must have an Observer designated by an appropriate National Antarctic Program during their first season of Antarctic operations. If none is available, IAATO will designate a qualified observer with reasonable compensation provided by the operator. A full observer report is to be forwarded to the Secretariat following the conclusion of the voyage.

Associate Members: Other organizations and individuals interested in or promoting travel to the Antarctic that which to support IAATO objectives and whose application has been formally accepted by two-thirds of the standing members.

Membership as of May 2001

Member	Country
<u>Full Members</u>	
Abercrombie & Kent/Explorer Shipping Corporation	United States
Adventure Associates	Australia
Aurora Expeditions	Australia
Hapag-Lloyd Kreuzfahrten	Germany
Heritage Expeditions	New Zealand
Lindblad Expeditions	United States
Mountain Travel•Sobek	United States
Clipper Cruise Line/New World Ship Management Company LLC	United States
Pelagic Expeditions	United Kingdom
Peregrine Adventures	Australia
Quark Expeditions	United States
Society Expeditions	United States
Wildwings/ Wildoceans	United Kingdom
Zegrahm Expeditions	United States
<u>Provisional (New) Members</u>	
Cheesemans' Ecology Safaris	United States
Golden Fleece Expeditions	UK/Falkland Is.
Ocean Frontiers Pty Ltd.	Australia
Oceanwide Expeditions	Netherlands
Plantours & Partners GmbH	Germany
Victor Emanuel Nature Tours	United States
<u>Probational Members</u>	
Marine Expeditions ³	Canada

³ Marine Expeditions filed for bankruptcy in 2001; its future status as an Antarctic tour operator is unknown.

<u>Associate Members</u>	
Agencia Maritima Internacional SA	Argentina
Antarctica Expeditions	Argentina
Asteria Antarctica	Belgium
Beluga Adventures	Netherlands
Cruise Tasmania	Australia
Expeditions, Inc.	United States ⁴
Galapagos Travel	United States
LaTour Chile	Chile
LifeLong Learning	United States
Natural Habitat Adventures	United States
Radisson Seven Seas Cruise	United States
Sintec Tur	Argentina
Students on Ice	Canada
Tauck World Discovery	United States

From: IAATO Membership Directory, May 2001.

⁴U.S.-based Expeditions, Inc., became a Provisional (New) Member in 1999, but moved to the Associate Member category when the company did not operate in Antarctica during the 1999-2000 season as planned. Their intent is to eventually operate cruises to the Peninsula area (Biggs, 16 June 2000).

Bylaws

Article I: Foundation, Name, Registration, Headquarters

Section A. The Association was founded in 1991 by seven Antarctic tour operators: Adventure Network International, Mountain Travel•Sobek, Paquet/Ocean Cruise Lines, Salen Lindblad Cruising, Society Expeditions, Travel Dynamics and Zegrahm Expeditions.

Section B. The name of the Association is "International Association of Antarctica Tour Operators." Henceforth, the abbreviated name "IAATO" will be used.

Section C. IAATO is registered in Olympia, Washington, USA.

Section D. IAATO currently has its headquarters in Basalt, Colorado, United States. At present, IAATO does not have any affiliated chapters, foreign or domestic. Chapters may be established in the future.

Article II: Objectives

Section A. To represent Antarctic tour operators and others organizing and conducting travel to the Antarctic to the Antarctic Treaty Parties, the international conservation community and the public at large.

Section B. To advocate, promote and practice safe and environmentally responsible travel to the Antarctic.

Section C. To circulate, promote and follow the *Guidance for Visitors to the Antarctic* and *Guidance for Those Organising and Conducting Tourism and Non-governmental Activities in the Antarctic*, as adopted by the Antarctic Treaty System (Recommendation XVIII-1).

Section D. To operate within the parameters of the Antarctic Treaty System, including the Antarctic Treaty and the Protocol on Environmental Protection to the Antarctic Treaty, along with IMO Conventions and similar international and national laws and agreements.

Section E. To foster continued cooperation among its members; to monitor IAATO programs, including the pattern and frequency of visits to specific sites within the Antarctic; and to coordinate itineraries so that no more than 100 passengers are ashore at any one time in any one place.

Section F. To provide a forum for the international, private-sector travel industry to share their expertise and opinions; and to uphold the highest standards.

Section G. To enhance public awareness and concern for the conservation of the Antarctic environment and its associated ecosystems and to better inform the media, governments and environmental organizations about private-sector travel to these regions.

Section H. To create a corps of ambassadors for the continued protection of Antarctica by offering the opportunity to experience the continent first hand.

Section I. To support science in Antarctica through cooperation with national Antarctic programs, including logistical support and research; and to foster cooperation between private-sector travel and the international scientific community in the Antarctic.

Section J. To ensure that the best qualified staff and field personnel are employed by IAATO members through continued training and education; and to encourage and develop international acceptance of evaluation, certification and accreditation programs for Antarctic personnel.

Article III: Membership

Section A. Membership is divided into four categories:

1. *Full Members* are experienced organizers that operate travel programs to the Antarctic and who: a) pledge to abide by IAATO Bylaws; b) agree not to carry more than 400 passengers per trip and to not have more than 100 passengers ashore at any one site at the same time; c) have been formally accepted by two-thirds of the standing members after review and fulfill any other requirements for membership.
2. *Provisional Members* are organizers that operate travel programs to the Antarctic that are requesting membership in IAATO. Provisional Members must: a) pledge to abide by IAATO Bylaws; b) agree not to carry more than 400 passengers per trip and to not have more than 100 passengers ashore at any one site at the same time; c) be formally accepted by two-thirds of the standing members after review and fulfill any other requirements for membership; and d) agree to carry an IAATO-approved Observer aboard on a voyage during the season and to forward the full observer report to the Secretariat. Provisional Members must have an Observer designated by an appropriate National Antarctic Program during their first season of Antarctic operations. If none is available, IAATO will designate a qualified observer with reasonable compensation provided by the operator. A full observer report must be forwarded to the Secretariat following the conclusion of the voyage.
3. *Probationary Members* are current or past Full Members who have not fully complied with IAATO by-laws or who otherwise are not in good standing as decided by a two-thirds vote of the full members. Probationary Members must a) pledge to abide by IAATO Bylaws; b) agree not to carry more than 400 passengers per trip and to not have more than 100 passengers ashore at any one site at the same time; and c) agree to carry an IAATO-approved Observer aboard for a voyage during the season and to forward the full observer report to the Secretariat. Probationary Members must have an Observer designated by an appropriate National Antarctic Program during their first season of Antarctic operations. If none is available, IAATO will designate a qualified observer with reasonable compensation provided by the operator. A full observer report is to be forwarded to the Secretariat following the conclusion of the voyage.
4. *Associate Members* are other organizations and individuals interested in or promoting travel to the Antarctic that wish to support IAATO objectives and whose application has been formally accepted by two-thirds of the standing members.

Section B. To be considered as Full Members, companies must have demonstrated the willingness and ability to adhere to and actively support IAATO objectives. Criteria for membership includes: the use of appropriate vessels and/or aircraft; hiring a sufficient number of qualified and experienced staff; and other obligations of *Guidance for Visitors to the Antarctic* and *Guidance for Those Organising and Conducting Tourism and Non-governmental Activities in the Antarctic*, as adopted by the Antarctic Treaty System (Recommendation XVIII-1). Also, consideration will be given to the professional standing of prospective members in the travel industry and prior experience conducting responsible tourism.

Section C. After a thorough review by the membership committee, Provisional and Probationary Members are eligible to apply as Full Members.

Section D. Membership is non-transferable. In the event a member company is acquired by another entity, the company would have to reapply for membership.

Section E. Members who drop their affiliation with IAATO and later wish to rejoin, must pay the initiation fee in order to be reinstated.

Section F. Members are subject to annual membership dues and fees as agreed from year-to-year by two-thirds of Full Members in good standing.

Section G. Members in good standing are those who continue to act in compliance with the Bylaws and are current with IAATO dues.

Section H. Members who do not comply with the Bylaws and/or do not pay applicable dues in a timely fashion will be subject to reprimand, change in status or expulsion after review by the membership or appointed committee.

Section I. Associate Members are subject to the payment of annual dues as proposed by the standing committee on membership and agreed by two-thirds of Full Members in good standing.

Section J. Membership will be reviewed at the annual IAATO meeting, including the status of Provisional and Probationary Members.

Section K. Members are required to make sure that a charterer, wholesaler, sponsoring organization or other third party conforms to IAATO objectives and Bylaws, particularly that these companies distribute appropriate materials and properly inform their passengers of proper conduct ashore. Furthermore, Members are responsible for ensuring payment of any per passenger fees to IAATO for these departures.

Section L. Use of the IAATO logo in brochures, advertisements or other promotional materials is reserved for Full and Associate Members in good standing.

Article IV: Organizational Structure

Section A. The Executive Secretary is a paid position. Terms of office, responsibilities, time requirements and remuneration will be defined according to proposed activities and budget and agreed upon by two-thirds of the Full Members.

Section B. The Executive Secretary's responsibilities may include but are not limited to:

- Act as a resource for the membership and clearinghouse for information.
- Act as a liaison with the media, scientific and conservation communities.
- Compile and distribute IAATO information to interested parties, through an IAATO website, newsletters, occasional press releases and other publications.
- Act as treasurer, developing a yearly budget and submitting to IAATO members a status report of IAATO activities and finances.
- Make and carry out recommendations in regard to IAATO activities and finances.
- Act as IAATO representative where required.
- Develop the agenda and coordinate meetings.
- Work closely with the Executive Committee and Representative.
- Maintain an accurate record of activities, including time and expenses related to authorized activities to be submitted to the Executive Committee or other designated individual or individuals for authorization for payment.

Section C. Responsibilities of a designated IAATO representative may include but are not limited to:

- Represent IAATO at Antarctic Treaty Consultative Meetings and other important meetings related to the Antarctic Treaty System.
- Promote IAATO objectives in dialogue with delegates and others at such meetings, and to initiate and draft appropriate working papers and written reports distributed at meetings.
- Provide an aggressive and supportive stance in written and oral presentations at meetings.
- Participate in hearings and other venues where Antarctic tourism and protection is discussed as designated.
- Prepare documents related to the above, including submissions for publication in appropriate journals, reports and books.
- Communicate and coordinate activities to the Executive Committee and membership via the Executive Secretary.
- Maintain an accurate record of activities, including time and expenses related to authorized activities to be submitted to the Executive Secretary for payment.

Section D. Individuals with relevant qualifications and who are willing and able to provide guidance and advice to IAATO may be invited to sit on an advisory board and named as Associate Members without compensation as approved by two-thirds of the Full Members.

Article V: Elections and Voting

Section A. Elections will be held at the annual meeting.

Section B. Full Members in good standing are eligible to vote and eligible for committee positions and other offices.

Section C. Each qualifying Full Member will have one vote.

Section D. Full Members in good standing who are unable to attend the annual meeting may nominate candidates and cast written votes on resolutions and nominations, provided that ballots are returned to the Executive Secretary prior to the meeting.

Section E. Full Members who are not in attendance forfeit their voting privileges on impromptu issues that arise during the meeting. The Executive Secretary will make a best effort to solicit resolutions, changes in Bylaws and other important matters before the meeting.

Section F. Any issue voted on will pass with two-thirds vote in favor of the issue.

Section G. A review of membership and any changes in membership will be voted on at the annual meeting.

Article VI: Standing Committees

Section A. A three-member Executive Committee will be elected at the annual meeting to assist the Secretariat. The committee shall make decisions on behalf of the full membership where appropriate and subject to ratification.

Section B. Further standing committees, as required and including a membership committee and finance committee, shall be elected by a two-thirds majority of full members in good standing, generally at the annual meeting.

Article VII: Meetings

Section A. A general meeting will be held at least once a year.

Section B. The Secretary will coordinate the time and venue of the meeting and advise full Members at least 60 days prior to the meeting.

Section C. Attendance at the general meeting is reserved for Full Members (including Provisional and Probationary). Requests to attend by associate, prospective members and non-members may be accepted by a two-thirds vote of the Full Members.

Section D. The Executive Secretary, or alternate, will take minutes during the meeting and distribute them within one month after the meeting to the membership.

Article VIII: Finances

Section A. The Executive Secretary will solicit, collect and administer all dues and fees.

Section B. The Executive Secretary will manage finances, make payments within budget constraints and make recommendations regarding annual budget, to be approved during the annual meeting.

Section C. Dues and fees are non-transferable and non-refundable. Overpayments will be credited to the member's account.

Section D. A detailed budget will be proposed by a standing committee 60 days prior to the annual

meeting, to be approved during the meeting by a two-thirds vote of Full Members.

Article IX: Amendments to IAATO Bylaws

Section A. These Bylaws may be amended by a resolution passed by two-thirds of the full members in good standing.

IAATO Membership Registration

- A. Contact information.
- B. IAATO Member since.
- C. Number of years operating in the Antarctic.
- D. Name of ships used in previous seasons.
- E. Incidents in previous years that have resulted in significant damage to the vessel or environment.
- F. Advance notice of planned expeditions supplied to what appropriate authority?
- G. Name, registry and specifications of each vessel you plan to use, including the number of crew and carrying capacity of each ship/aircraft.
- H. Contact information for each vessel (call sign, INMARSAT).
- I. Number of voyages planned per vessel and planned itineraries.
- J. Do you plan any non ship-based tours and/or plan extended time off the vessel in the Antarctic Treaty Area? If yes, please describe.
- K. Total number of passengers you expect to carry.
- L. Statement of the status of compliance with environmental assessment requirements, including contingency and waste management plans.
- M. Methods of educating passengers staff and crew of Recommendation XVIII-1 and other obligations.
- N. What are your staff positions and who is on your expedition staff? List name and Antarctic experience where possible.
- O. Signed statement that you have read the IAATO Bylaws and Membership Criteria as well as Recommendation XVIII-1 and agree to follow same.
- P. Payment of annual dues and 65% of the per passenger fee based on the estimated passenger load. Please, wire transfers or checks in U.S. dollars drawn on a U.S. bank.

*Appendix 8: Guidance for Those Organising
and Conducting Tourism and Nongovern-
mental Activities in the Antarctic and
Guidance for Visitors to the Antarctic*

Appendix 8
**Guidance for Those Organising and Conducting Tourism and Nongovernmental
Activities in the Antarctic and Guidance for Visitors to the Antarctic**

<u>Section</u>	<u>Page</u>
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Guidance for Visitors to the Antarctic	Appendix 8-5

Appendix 8¹

Guidance for Those Organising and Conducting Tourism and Nongovernmental Activities in the Antarctic

Recommendation XVIII-1, Adopted at the Antarctic Treaty Meeting, Kyoto, 1994

Antarctica is the largest wilderness area on earth, unaffected by large scale human activities. Accordingly, this unique and pristine environment has been afforded special protection. Furthermore, it is physically remote, inhospitable, unpredictable and potentially dangerous. All activities in the Antarctic Treaty Area, therefore, should be planned and conducted with both environmental protection and safety in mind.

Activities in the Antarctic are subject to the Antarctic Treaty of 1959 and associated legal instruments, referred to collectively as the Antarctic Treaty system. These include the Convention for the Conservation of Antarctic Seals (CCAS 1972), the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR 1980) and the Recommendations and other measures adopted by the Antarctic Treaty Consultative Parties under the Antarctic Treaty.

In 1991, the Consultative Parties to the Antarctic Treaty adopted the Protocol on Environmental Protection to the Antarctic Treaty. This Protocol sets out environmental principles, procedures and obligations for the comprehensive protection of the Antarctic environment, and its dependent and associated ecosystems. The Consultative Parties have agreed that, pending its entry into force, as far as possible and in accordance with their legal systems, that the provisions of the Protocol should be applied as appropriate.

The Environmental Protocol designates Antarctica as a natural reserve devoted to peace and science, and applies to both governmental and non-governmental activities in the Antarctic Treaty Area. The Protocol seeks to ensure that human activities, including tourism, do not have adverse impacts on the Antarctic environment, nor on its scientific and aesthetic values.

The Protocol states, as a matter of principle, that all activities are to be planned and conducted on the basis of information sufficient to evaluate their possible impact on the Antarctic environment and its associated ecosystems, and on the value of Antarctica for the conduct of scientific research. Organisers should be aware that the Environmental Protocol requires that "activities shall be modified, suspended or cancelled if they result in or threaten to result in impacts upon the Antarctic environment or dependent or associated ecosystems."

Those responsible for organising and conducting tourism and non-governmental activities must comply fully with national laws and regulations which implement the Antarctic Treaty system, as well as other national laws and regulations implementing international agreements on environmental protection, pollution and safety that relate to the Antarctic Treaty Area. They should also abide by the requirements imposed on organisers and operators under the Protocol on Environmental Protection and its Annexes, in so far as they have not yet been implemented in national law.²

Key Obligations on Organisers and Operators

- 1) Provide prior notification of, and reports on, their activities to the competent authorities of the appropriate Party or Parties.
- 2) Conduct an assessment of the potential environmental impacts of their planned activities.

¹ Excerpted from pamphlet prepared by the International Association of Antarctic Tour Operators, Office of the Secretariat, P.O. Box 2178, Basalt, CO 81621

² The Protocol entered into force in 1998.

- 3) Provide for effective response to environmental emergencies, especially with regard to marine pollution.
- 4) Ensure self-sufficiency and safe operations.
- 5) Respect scientific research and the Antarctic environment, including restrictions regarding protected areas, and the protection of flora and fauna.
- 6) Prevent the disposal and discharge of prohibited waste.

Procedures To Be Followed By Organisers And Operators

A) *When planning to go to the Antarctic* — Organizers and operators should:

- 1) Notify the competent national authorities of the appropriate Party or Parties of details of their planned activities with sufficient time to enable the Party(ies) to comply with their information exchange obligations under Article VII(5) of the Antarctic Treaty. The information to be provided is listed in Attachment A.
- 2) Conduct an environmental assessment in accordance with such procedures as may have been established in national law to give effect to Annex I of the Protocol, including, if appropriate, how potential impacts will be monitored.
- 3) Obtain timely permission from the national authorities responsible for any stations they propose to visit.
- 4) Provide information to assist in the preparation of: contingency response plans in accordance with Article 15 of the Protocol; waste management plans in accordance with Annex III of the Protocol; and marine pollution contingency plans in accordance with Annex IV of the Protocol.
- 5) Ensure that expedition leaders and passengers are aware of the location and special regimes which apply to Specially Protected Areas and Sites of Special Scientific Interest (and on entry into force of the Protocol, Antarctic Specially Protected Areas and Antarctic Specially Managed Areas) and of Historic Sites and Monuments and, in particular, relevant management plans.
- 6) Obtain a permit, where required by national law, from the competent national authority of the appropriate Party or Parties, should they have a reason to enter such areas, or a monitoring site (CEMP Site) designated under CCAMLR.
- 7) Ensure that activities are fully self-sufficient and do not require assistance from Parties unless arrangements for it have been agreed in advance.
- 8) Ensure that they employ experienced and trained personnel, including a sufficient number of guides.
- 9) Arrange to use equipment, vehicles, vessels, and aircraft appropriate to Antarctic operations.
- 10) Be fully conversant with applicable communications, navigation, air traffic control and emergency procedures.
- 11) Obtain the best available maps and hydrographic charts, recognising that many areas are not fully or accurately surveyed.
- 12) Consider the question of insurance (subject to requirements of national law).
- 13) Design and conduct information and education programmes to ensure that all personnel and visitors are aware of relevant provisions of the Antarctic Treaty system.
- 14) Provide visitors with a copy of the *Guidance for Visitors to the Antarctic*.

B) *When in the Antarctic Treaty Area* — Organisers and operators should:

- 1) Comply with all requirements of the Antarctic Treaty system, and relevant national laws, and ensure that visitors are aware of requirements that are relevant to them.
- 2) Reconfirm arrangements to visit stations 24-72 hours before their arrival and ensure that visitors are aware of any conditions or restrictions established by the station.
- 3) Ensure that visitors are supervised by a sufficient number of guides who have adequate experience and training in Antarctic conditions and knowledge of the Antarctic Treaty system requirements.

- 4) Monitor environmental impacts of their activities, if appropriate, and advise the competent national authorities of the appropriate Party or Parties of any adverse or cumulative impacts resulting from an activity, but which were not foreseen by their environmental impact assessment.
- 5) Operate ships, yachts, small boats, aircraft, hovercraft, and all other means of transport safely and according to appropriate procedures, including those set out in the Antarctic Flight Information Manual (AFIM).
- 6) Dispose of waste materials in accordance with Annex III and IV of the Protocol. These annexes prohibit, among other things, the discharge of plastics, oil and noxious substances into the Antarctic Treaty Area; regulate the discharge of sewage and food waste; and require the removal of most wastes from the area.
- 7) Co-operate fully with observers designated by Consultative Parties to conduct inspections of stations, ships, aircraft and equipment under Article VII of the Antarctic Treaty, and those to be designated under Article 14 of the Environmental Protocol.
- 8) Co-operate in monitoring programmes undertaken in accordance with Article 3(2)(d) of the Protocol.
- 9) Maintain a careful and complete record of their activities conducted.

C) *On Completion of the Activities*

Within three months of the end of the activity, organisers and operators should report on the conduct of it to the appropriate national authority in accordance with national laws and procedures. Reports should include the name, details and state of registration of each vessel or aircraft used and the name of their captain or commander; actual itinerary; the number of visitors engaged in the activity; places, dates and purposes of landings and the number of visitors landed on each occasion; any meteorological observations made, including those made as part of the World Meteorological Organization (WMO) Voluntary Observing Ships Scheme; any significant changes in activities and their impacts from those predicted before the visit was conducted; and action taken in case of emergency.

D) *Antarctic Treaty System Documents and Information*

Most Antarctic Treaty Parties can provide, through their national contact points, copies of relevant provisions of the Antarctic Treaty system and information about national laws and procedures, including:

- The Antarctic Treaty (1959)
- Convention on the Conservation of Antarctic Marine Living Resources (1980)
- Protocol on Environmental Protection to the Antarctic Treaty (1991)
- Recommendations and other measures adopted under the Antarctic Treaty
- Final Reports of Consultative Meetings
- Handbook of the Antarctic Treaty System (1994)
- Handbook of the Antarctic Treaty System (in Spanish, 1991)

ATTACHMENT A

Information to be Provided in Advance Notice

Organisers should provide the following information to the appropriate national authorities in the format requested.

1. Name, nationality, and contact details of the organiser;
2. Where relevant, registered name and national registration and type of any vessel or aircraft to be used (including name of the captain or commander, call-sign, radio frequency, INMARSAT number);
3. Intended itinerary including the date of departure and places to be visited in the Antarctic Treaty Area;
4. Activities to be undertaken and purpose;
5. Number and qualifications of crew and accompanying guides and expedition staff;
6. Estimated number of visitors to be carried;
7. Carrying capacity of vessel;
8. Intended use of vessel;

9. Intended use and type of aircraft;
10. Number and type of other vessels, including small boats, to be used in the Antarctic Treaty Area;
11. Information about insurance coverage;
12. Details of equipment to be used, including for safety purposes, and arrangements for self-sufficiency;
13. And other matters required by national laws.

Guidance for Visitors to the Antarctic ³

Recommendation XVIII-1, Adopted at the Antarctic Treaty Meeting, Kyoto, 1994

Activities in the Antarctic are governed by the Antarctic Treaty of 1959 and associated agreements, referred to collectively as the Antarctic Treaty System. The Treaty established Antarctica as a zone of peace and science.

In 1991, the Antarctic Treaty Consultative Parties adopted the Protocol on Environmental Protection to the Antarctic Treaty, which designates the Antarctic as a natural reserve. The Protocol sets out environmental principles, procedures and obligations for the comprehensive protection of the Antarctic environment, and its dependent and associated ecosystems. The Consultative Parties have agreed that, pending its entry into force, as far as possible and in accordance with their legal system, the provisions of the Protocol should be applied as appropriate.

The Environmental Protocol applies to tourism and nongovernmental activities, as well as governmental activities in the Antarctic Treaty Area. It is intended to ensure that these activities do not have adverse impacts on the Antarctic environment, or on its scientific and aesthetic values.

This *Guidance for Visitors to the Antarctic* is intended to ensure that all visitors are aware of, and are therefore able to comply with, the Treaty and the Protocol. Visitors are, of course, bound by national laws and regulations applicable to activities in the Antarctic.

Protect Antarctic Wildlife

Taking or harmful interference with Antarctic wildlife is prohibited except in accordance with a permit issued by a national authority.

- Do not use aircraft, vessels, small boats, or other means of transport in ways that disturb wildlife, either at sea or on land.
- Do not feed, touch, or handle birds or seals, or approach or photograph them in ways that cause them to alter their behavior. Special care is needed when animals are breeding or molting.
- Do not damage plants, for example by walking, driving, or landing on extensive moss beds or lichen-covered scree slopes.
- Do not use guns or explosives. Keep noise to the minimum to avoid frightening wildlife.
- Do not bring non-native plants or animals into the Antarctic such as live poultry, pet dogs and cats or house plants.

Respect Protected Areas

A variety of areas in the Antarctic have been afforded special protection because of their particular ecological, scientific, historic or other values. Entry into certain areas may be prohibited except in

³ Excerpted from pamphlet prepared by the International Association of Antarctic Tour Operators, Office of the Secretariat, P.O. Box 2178, Basalt, CO, 81621

accordance with a permit issued by an appropriate national authority. Activities in and near designated Historic Sites and Monuments and certain other areas may be subject to special restrictions.

- Know the locations of areas that have been afforded special protection and any restrictions regarding entry and activities that can be carried out in and near them.
- Observe applicable restrictions.
- Do not damage, remove, or destroy Historical Monuments or any artifacts associated with them.

Respect Scientific Research

Do not interfere with scientific research, facilities or equipment.

- Obtain permission before visiting Antarctic science and support facilities; reconfirm arrangements 24-72 hours before arrival; and comply with the rules regarding such visits.
- Do not interfere with, or remove, scientific equipment or marker posts, and do not disturb experimental study sites, field camps or supplies.

Be Safe

Be prepared for severe and changeable weather and ensure that your equipment and clothing meet Antarctic standards. Remember that the Antarctic environment is inhospitable, unpredictable, and potentially dangerous.

- Know your capabilities, the dangers posed by the Antarctic environment, and act accordingly. Plan activities with safety in mind at all times.
- Keep a safe distance from all wildlife, both on land and at sea.
- Take note of, and act on, the advice and instructions from your leaders; do not stray from your group.
- Do not walk onto glaciers or large snow fields without the proper equipment and experience; there is a real danger of falling into hidden crevasses.
- Do not expect a rescue service. Self-sufficiency is increased and risks reduced by sound planning, quality equipment, and trained personnel.
- Do not enter emergency refuges (except in emergencies). If you use equipment or food from a refuge, inform the nearest research station or national authority once the emergency is over.
- Respect any smoking restrictions, particularly around buildings, and take great care to safeguard against the danger of fire. This is a real hazard in the dry environment of Antarctica.

Keep Antarctica Pristine

Antarctica remains relatively pristine, the largest wilderness area on Earth. It has not yet been subjected to large scale human perturbations. Please keep it that way.

- Do not dispose of litter or garbage on land. Open burning is prohibited.
- Do not disturb or pollute lakes or streams. Any materials discarded at sea must be disposed of properly.
- Do not paint or engrave names or graffiti on rocks or buildings.
- Do not collect or take away biological or geological specimens or man-made artifacts as a souvenir, including rocks, bones, eggs, fossils, and parts or contents of buildings.
- Do not deface or vandalize buildings, whether occupied, abandoned, or unoccupied, or emergency refuges.

*Appendix 9: U.S.-Based IAATO Member
Operators: Opportunistic Process for
Selecting Landing Sites*

Appendix 9

U.S.-Based IAATO Member Operators: Opportunistic Process for Selecting Landing Sites¹

Two-Phase Process

Phase 1: Initial itineraries planned and circulated to other tour operators prior to commencement of the expedition.

Phase 2: In field adjustments to the initial itinerary on a daily basis as a result of conditions and opportunities encountered en route.

Phase 1: Planning

Purpose: To achieve an expedition that gives passengers an overview of the area being visited.

Selection Criteria: Number of days in the Antarctic region, marketing emphasis, vessel speed, number of passengers

Requisite Sites or Features:

- visits to renowned sites, e.g., Deception Island, Paradise Bay and Lemaire Channel
- 'Key' components of natural history, e.g., specific bird and mammal species, geologic features
- A landing on the Antarctic continent
- Sites of historic interest, both exploration and sealing and whaling
- A visit to a scientific station

Key Principles: Decision of which site to visit and at what stage of the expedition depends on several factors including: (1) Start with landings which are simple - sheltered sites, ample space near landing point for passengers to adjust to the environment and operation procedures without disrupting wildlife, safe and easy to move around. (2) Manage expectations to ensure each day is 'better' than the day before - often areas with high species diversity, spectacular scenery or unusual occurrences are perceived as 'more exciting;' require better understanding of code of conduct because of increased awareness of biota and potential for disturbance, safety reasons, proximity to protected areas.

Final Decisions: Based on local knowledge of areas involved with consideration of site's attractions and how they fit in with what has been experienced and what will be experienced.

Operator Coordination: Overall route plan, including planned landings, circulated to other vessels operating in the area to avoid multiple vessels trying to land at same site at same time; based on assumption that conditions will not prohibit landing passengers.

Phase 2: Adjustments in Itineraries

Purpose: Adjustments necessitated by weather, ice conditions, other ships' schedules, and opportunities that become apparent during the voyage.

Criteria: (1) Attraction of the site; (2) shore operation including passenger controls and safety; and (3) marine operation including ship and zodiac considerations, and water and landing conditions.

Final Decisions: Conditions permit and ability of expedition leader to control the use of the site to ensure the landing is safe, protected areas are not encroached, and the visit causes minimal disturbance to the local environment.

Operator Coordination: If adjustments made 24 hours or more in advance, notification is usually sent to other vessels to avoid conflict with multiple vessels at same site at same time.

¹IAATO IEE, Appendix XI, 1997

***Appendix 10: Quark Expeditions' Use of
Helicopters Aboard the Kapitan Khlebnikov***

Appendix 10

Quark Expeditions' Use of Helicopters

Aboard the *Kapitan Khlebnikov*¹

Helicopter Use:

Flightseeing: Generally occurs in the vicinity of the vessel for purposes of photographing the ship breaking ice, over ice shelves or up mountain valleys.

Duration: 15 minutes to 1 hour per group, total flight time 2-4 hours.

Flightseeing and Landing: Helicopters may pass over a scenic area for a few minutes prior to landing at a specific site.

Landings: Passengers shuttled from the ship to the appointed landing site and returned to the vessel following a specific amount of time ashore with no more than 100 passengers ashore at any one time. Landings are generally on ice or snow, and at stations, Emperor Rookeries, Dry Valleys, Larsemann Hills, and wherever else necessary if zodiacs cannot be deployed.

Duration: 1 to 6 hours.

Individual Charters: Passengers may be offered the opportunity to charter the helicopters for additional flightseeing weather, time and fuel conditions permitting.

Station Visits:

All station visits are coordinated with the station commander or appointed person with station staff advising where the helicopter should land.

Flight Operations:

All helicopter operations conducted according to Standard Operating Procedures, including measures to avoid potential impacts, and in accordance with Recommendation XVIII-1 to assure any impacts are no more than minor or transitory at any of the landing sites. Helicopters do not fly below 500 meters and maintain a minimum distance of 1 Km from an Emperor Rookery. Scheduling set to minimize unnecessary trips to and from the landing site, and to minimize impacts from noise, wind, soils and dust.

Passengers:

Passengers are briefed on specific landing procedures prior to and once on shore including compliance with Recommendation XVIII-1.

¹Quark IEE 1997

*Appendix 11: Adventure Network
International Environmental Policy and
Operational Guidelines for Antarctica*

Appendix 11

Adventure Network International Environmental Policy and Operational Guidelines for Antarctica¹

Environmental Policy

While ANI's programs are planned to provide maximum safety for all participants, they are also planned for minimal impact on the environment.

ANI has adopted the following environmental policy for its operations concentrating on Patriot Hills. Where possible the following environmental policy applies to Mt. Vinson base camp, satellite camps and for expeditions in progress.

- (1) All human waste (i.e., solid and liquid sewage) is removed from Antarctica;
- (2) All putrescible organic waste (i.e., domestic solid kitchen waste) is removed from Antarctica;
- (3) Sullage (i.e., grey water from the kitchen, laundry and shower) is disposed of in Antarctica;
- (4) All solid waste (i.e., cans, bottles, aluminum, plastic) is removed from Antarctica;
- (5) All hazardous domestic waste (i.e., batteries, aerosol cans, paints and solvents) is removed from Antarctica;
- (6) Other hazardous waste (i.e., fuel and gas bottles) is removed from Antarctica;
- (7) No incineration takes place; and
- (8) There is zero loss of fuel drums (i.e., all fuel drums are inventoried to avoid loss and either reused or removed from Antarctica).

Guidelines - ANI and their contractors undertake to:

- Know and understand the relevant provisions of the Protocol on Environmental Protection to the Antarctic Treaty and Annexes, and shall whenever practicable fully comply with those provisions, whether or not their own country has issued legislation to require compliance. They will also ensure that all staff and clients are properly briefed on those provisions that might affect them.
- Operate flights and programs such that maximum safety for all participants and with minimum impact on the Antarctic environment is assured.
- Establish a set of policies and emergency procedures that will be applicable to all foreseeable accidents and unplanned events that might occur with the operations.
- Provide pilots, guides and support personnel who have had adequate training and experience, in the context of Antarctica, to cope with anticipated conditions, potential problems and reasonably foreseeable emergencies.
- Arrange back-up aircraft to be available for all air and land-based activity.
- Verify that all participants are in adequate physical condition to cope with the anticipated physiological, topographic and climatic rigors that will be encountered.
- Maintain regular radio contact between their operational aircraft or field parties and their base of field operations, and between field base and the outside world. This will include maintaining a listening radio watch while any of their aircraft are in the air.
- Provide all aircraft with appropriate survival equipment and emergency supplies to support the crew and all passengers for at least two weeks.
- Establish and maintain at adequate levels caches of fuel to enable the emergency evacuation by air of injured or sick personnel to the nearest medical facility.
- Establish and maintain at adequate levels caches of camping equipment, food, cooking fuel and medical supplies to enable all personnel, staff and clients, to survive in the field for at least 30 days without re-supply from outside.
- Maintain close working collaboration with the appropriate aeronautical authorities, civil and

¹ANI (1998)

military for air traffic control, Search and Rescue, meteorological reports, etc., and contact with other air operators.

- Maintain a policy of having all aircraft under their control available at all times to respond, if required, to an emergency in Antarctica.
- Operate aircraft such that populations of birds and seals are not subject to stress, such as landing or taking off, low flying, air drops, etc., within 1500 meters (1 mile) of breeding colonies.
- Take all reasonable precautions that fuel, etc., stored in caches does not leak or is spilled during re-fueling operations. Fuel caches located in areas of snow accumulation and/or glacier movement will be marked with adequate beacons to enable recovery at a later date.
- Remove from Antarctica for sanitary disposal back in civilization all refuse (including human waste) generated at their operational bases. Wherever feasible and consistent with associated environmental impact, collect and remove refuse generated by their field parties, including fuel drums, etc.

*Appendix 12: Total Number of Antarctic
Visitors by Season and Percentage Change
from Preceding Season*

Appendix 12
Total Number of Antarctic Visitors by Season and Percent Change
from Preceding Season

Season	Total number of Antarctic visitors	% change in numbers of visitors from preceding season
89-90	2,460	- 24.7% decrease from 3,146 visitors in the 1988-89 season
90-91	4,698	0.2%
91-92	7,103	51.2%
92-93	6,166	13.2%
93-94	7,957	29.0%
94-95	8,090	1.7%
95-96	9,212	13.9%
96-97	7,322	20.5%
97-98	9,473	29.4%
98-99	10,013	5.7%
Overall, 1989-99	2,460 to 10,013	407.0%

From: Naveen 1999

*Appendix 13: Comparison of Landings in
the Peninsula and Ross Sea Areas*

Appendix 13
Comparison of Landings
in the Peninsula and Ross Sea Areas

Season	Landings in Peninsula Area	Landings in Ross Sea Area	Total Landings	% of Landings in Peninsula Area
89-90	164	NA ¹	NA	NA
90-91	161	NA	NA	NA
91-92	327	NA	NA	NA
92-93	348	44	392	88.8%
93-94	488	6	494	98.8%
94-95	704	12	716	98.3%
95-96	784	10	794	98.7%
96-97	775	39	814	95.2%
97-98	714	36	750	95.2%
98-99	858	26	884	97.1%

From: Naveen 1999

¹Information not available.

*Appendix 14: Antarctic Tourism for the
Three Austral Seasons, 1997 through 2000*

Appendix 14
Antarctic Tourism for the
Three Austral Seasons, 1997 through 2000

Summary of Antarctic Tourism, 1997 through 2000			
	1997-1998 Exp/pax	1998-1999 Exp/pax	1999-2000 Exp/pax(Est)
Land-based tourism (ANI)	NA/131	NA/79	NA/200
<u>Peninsula Area:</u>			
U.S.- IAATO Operators	32/2,454	49/3,779	59/4,606
U.S.- Orient Lines	4/2,012	4/2,177	5/2,325
Foreign - IAATO/non-IAATO	48/4,364	44/3,572	68/6,650
Yachts	14/95	14/90	22/192
SUB-TOTALS:	98/8,925	111/9,618	154/13,773
<u>Ross Sea Area:</u>			
U.S. Operators	3/275	2/152	2/200
Foreign - IAATO/non-IAATO	5/273	3/164	2/92
SUB-TOTALS:	8/548	5/316	4/292
<u>TOTALS:</u>			
All Operators (Land/Ship)	—/9,604	—/10,013	—/14,285 ¹
Ship-Based Operators	106/9,473	116/9,934	158/14,065

Sources: IAATO IEE 1998, IAATO IEE 1999 and IAATO Online 2000.

¹This number excludes: (1) the estimated 1,000 passengers aboard the *Rotterdam* since the vessel only cruised through Antarctic waters with no small boat cruising or passenger landings (In: "Initial Environmental Evaluation, ms Rotterdam – 2000 World Cruise," Holland America Line, Westours, Inc., March 22, 1999); (2) the land-based programs operated by Adventure Network International; and (3) the *Lyubov Orlova* (Marine Expeditions, Canada) which was scheduled for one voyage to the Peninsula and Ross Sea areas but this voyage was canceled (Landau 2001).

Percentages of Tourists and Numbers of Expeditions, 1997 through 2000									
	1997-1998		1998-1999		1999-2000		Averages		
<u>LAND-BASED TOURISM</u>									
% of Total	1.4%		0.8%		1.4%		1.2%		
<u>SHIP-BASED TOURISM</u>	RS	PA	RS	PA	RS	PA	RS	PA	
<u>Total Ship-Based:</u>									
No. Expeditions	8%	92%	4%	96%	3%	97%	5%	95%	
No. Passengers	6%	94%	3%	97%	2%	98%	4%	96%	
<u>SHIP-BASED, PENINSULA ONLY</u>	%Exp	%Pax	%Exp	%Pax	%Exp	%Pax	%Exp	%Pax	
Yachts/Total Ship-Based	14%	1%	13%	1%	14%	1%	14%	1%	
All U.S.Ops/Total Sh.-Based	37%	50%	48%	62%	42%	50%	42%	54%	
Orient Lines/All U.S. Ops	12%	82%	8%	58%	8%	50%	9%	63%	

Abbreviations Used in Tables:

Exp - Expeditions
Pax - Passengers
Est - Estimates
NA - Number of expeditions "Not Available"
RS - Ross Sea
PA - Peninsula Area
Ops - Operators

*Appendix 15: Total Number of Peninsula
Area Landings and Visitors by Season and
Percent Change from Preceding Season*

Appendix 15
Total Number of Peninsula Area Landings and Visitors
by Season and Percent Change from Preceding Season

Season	Number of Landings	% Change	Number of Visitors	% Change
89-90	164	NA	17,759	NA
90-91	161	- 1.8%	19,001	+ 7.0%
91-92	327	+ 103.1%	38,828	+ 104.4%
92-93	348	+ 6.4%	27,789	- 28.4%
93-94	488	+ 40.2%	50,035	+ 80.1%
94-95	704	+ 44.3%	52,610	+ 5.2%
95-96	784	+ 11.4%	61,345	+ 16.6%
96-97	775	- 1.1%	54,286	- 11.5%
97-98	714	- 7.9%	66,387	+ 22.3%
98-99	858	+ 20.2%	74,772	+ 12.6%
Overall, 1989-99	164 to 858	+ 523.2%	17,759 to 74,772	+ 421.0%

From: Naveen 1999

Appendix 16: Zodiacs in the Peninsula Area: 35 Peninsula Area Sites Visited by Zodiac Landings in the Base Season (1989-90), and Subsequent Number of Landings by Season, and Number of Annual Zodiac Landings in the Peninsula Area

Appendix 16
Zodiacs in the Peninsula Area:
35 Peninsula Area Sites Visited by Zodiac Landings
in the Base Season (1989-90) and Subsequent Number of Landings
by Season, and Number of Annual Zodiac Landings in the Peninsula Area

<u>Table</u>	<u>Title</u>	<u>Page</u>
Table 16.1.	35 Peninsula Area Sites Visited by Zodiac Landings in the Base Season and Subsequent Numbers of Landings by Season	Appendix 16-2
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Appendix 16
35 Peninsula Area Sites Visited by Zodiac Landings
in the Base Season (1989-90) and
Subsequent Numbers of Landings by Season

Table 16.1. 35 Peninsula Area Sites Visited by Zodiac Landings in the Base Season and Subsequent Numbers of Landings by Season											
Landing Sites (*Sites with 100+ Landings & 9,000+ Passengers)	Region	89-90	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99
Adelaide Island	SW	2	0	0	0	0	0	0	0	1	0
<i>Aitcho Islands*</i>	SH	2	0	3	7	3	10	23	37	31	31
<i>Akademic Vernadskiy (ex-Faraday) Station*</i>	SW	2	5	4	3	2	4	5	6	19	22
<i>Almirante Brown Station*</i>	NW	10	16	26	19	31	43	25	38	34	17
<i>Arctowski Station</i>	SH	8	6	14	10	30	31	21	22	11	13
Ardley Island	SH	4	2	0	1	1	2	0	1	0	1
<i>Baily Head (incl. Rancho Point)*</i>	SH	5	6	14	10	9	32	19	14	20	20
<i>Cuverville Island*</i>	NW	8	8	21	25	27	47	59	56	53	55
Detaille Island	SW	1	2	0	3	0	2	0	1	4	3
False Bay, Livingston Island	SH	1	0	0	0	0	0	0	0	0	0
<i>Ferraz Station*</i>	SH	3	1	6	2	12	10	4	3	5	4
<i>Frei Station/Marsh Base*</i>	SH	6	4	8	2	1	9	6	5	0	0
<i>Half Moon Island*</i>	SH	10	9	25	14	17	38	49	35	33	33
<i>Hannah Point*</i>	SH	3	2	17	23	29	46	37	46	39	48
<i>Hope Bay (Esperanza Station)*</i>	NE	1	3	9	3	17	11	17	7	10	9
<i>Jubany Station*</i>	SH	1	1	3	4	6	3	0	0	3	6

Landing Sites (*Sites with 100+ Landings & 9,000+ Passengers)	Region	89-90	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99
<i>Lion's Rump*</i>	SH	6	7	4	0	0	0	0	0	0	0
Melchoir Islands (nonspecific)	NW	1	0	3	1	2	1	0	3	1	3
Mikklesen Harbor	NW	1	0	1	7	0	3	2	1	5	3
<i>Palmer Station, Anvers Island*</i>	NW	11	9	11	9	10	9	8	11	14	12
<i>Paulet Island*</i>	NE	7	4	14	16	18	30	31	31	8	37
<i>Pendulum Cove, Deception Island*</i>	SH	7	10	19	23	33	41	42	44	31	50
<i>Penguin Island*</i>	SH	3	0	1	7	13	24	23	12	15	20
<i>Petermann Island*</i>	SW	6	11	14	14	30	42	47	34	42	38
<i>Point Lookout, Elephant Island*</i>	EI	5	2	5	4	6	9	4	8	7	9
Point Wild, Elephant Island	EI	2	2	2	1	1	3	1	0	2	1
<i>Port Lockroy (inc. Jougla Point)*</i>	NW	7	7	19	22	30	27	42	58	63	75
Rothera Station, Adelaide Island	SW	1	0	0	0	0	2	1	0	0	0
<i>Shingle Cove, Coronation Island*</i>	SO	4	1	2	0	5	4	2	4	0	5
Signy Island (nonspecific)	SO	1	0	0	2	0	1	0	0	0	0
Snow Hill Island	NE	2	0	1	0	0	4	2	1	0	5
Stonington Island	SW	1	0	0	0	0	2	0	0	0	0
<i>Telefon Bay*</i>	SH	6	4	6	1	12	5	7	4	7	13
<i>Waterboat Point (Gonzales Videla Station)*</i>	NW	9	10	15	19	17	20	14	12	12	20
<i>Whalers Bay*</i>	SH	17	13	23	22	37	66	67	51	60	69

From: Naveen, 1999

Abbreviations Used in Table for Region:

SO - South Orkneys

Includes Laurie, Coronation, and Signy Islands

EI - Elephant Island

Includes nearby islands

SH - South Shetland Islands

Including Deception, Low, and Smith Islands

NE - Northeast Antarctic Peninsula

From Cape Dubouzet (63°16'S,64°00'W) and Joinville Island (63°15'S,55°45'W) to James Ross Island (64°10'S,57°45'W)

NW - Northwest Antarctic Peninsula

From Cape Dubouzet (63°16'S,64°00'W) to northern end of the Lemaire Channel (65°04'S,63°57'W)

SW - Southwest Antarctic Peninsula

From the northern end of the Lemaire Channel to the northern part of Marguerite Bay (68°18'S,67°11'W)

Table 16.2. Number of Annual Zodiac Landings in the Peninsula Area		
Season	Peninsula Area Landings	Percent Change
89-90	164	NA
90-91	161	- 1.8%
91-92	327	+ 103.1%
92-93	348	+ 6.4%
93-94	488	+ 40.2%
94-95	704	+ 44.3%
95-96	784	+ 11.4%
06-97	775	- 1.1%
97-98	714	- 7.9%
98-99	858	+ 20.2%
Overall, 1989-99	164 to 858	+ 523.17%

From: Naveen 1999

*Appendix 17: Activities in the Peninsula
Area Other Than Zodiac Landings*

Appendix 17
Activities in the Peninsula Area
Other Than Zodiac Landings

HELICOPTER LANDS

SW Stonington Island
SW Wiggins Glacier

HELICOPTER OVERFLIGHTS

SH Paradise Bay (nonspecific)
NW Errera Channel
SW Southwind Pass

SNORKELING and SCUBA

SH Baily Head, Deception Island
SH Jubany Station
NW Hydruga Rocks
NW Lion Island
NW Port Lockroy, Wiencke Island
NW Cuverville Island
NW Danco Island

ICE WALKING

NW Charlotte Bay

CAMPING

NW Damoy Point
NW Neko Harbor
NW Port Lockroy
NW Portal Point
SW Hovgaard Island
SW Pleneau Island
SW Pleneau Island

ZODIAC TOURS, NO VISITOR LANDINGS

SH Admiralty Bay, King George Island
NE "Andersen" Island (probably Andersson Island)
NE Antarctic Sound
NE Fridtjof Sound (Tabarin Peninsula)
NE Madder Cliffs, Jinville Island
NW Andvord Bay (west coast Graham Land)
NW Bismarck Strait
NW Bone Bay, Trinity Peninsula
NW Cape Kjellman, Charcot Bay, Trinity Peninsula
NW Dallman Bay (between Brabant & Anvers Islands)
NW Enterprise Islands
NW Errera Channel
NW Gerlache Strait
NW Huemel Island (Megaptera Island)
NW Intercurrence Island, Christiana Islands
NW Laypeyrere Bay, Gourdon Peninsula

NW	Lindblad Cove
NW	Murray Harbor, Murray Island
NW	Palaver Point, Two Hummock Island
NW	Schollert Channel (between Anvers and Brabant Islands)
NW	Wauwemans Islands
SW	Berthelot Islands
SW	Cape Evenson (west coast Graham Land)
SW	Flandres Bay
SW	Grandidier Channel
SW	Gunnel Channel, Hanusse Bay
SW	Lemaire Channel
SW	Pleneau Bay

From: Naveen, 1999

Abbreviations Used for Region:

SO - South Orkneys	Includes Laurie, Coronation, and Signy Islands
EI - Elephant Island	Includes nearby islands
SH - South Shetland Islands	Including Deception, Low, and Smith Islands
NE - Northeast Antarctic Peninsula	From Cape Dubouzet (63/16'S,64/00'W) and Joinville Island (63/15'S,55/45'W) to James Ross Island (64/10'S,57/45'W)
NW - Northwest Antarctic Peninsula	From Cape Dubouzet (63/16'S,64/00'W) to northern end of the Lemaire Channel (65/04'S,63/57'W)
SW - Southwest Antarctic Peninsula	From the northern end of the Lemaire Channel to the northern part of Marguerite Bay (68/18'S,67/11'W)

*Appendix 18: Forecast for Ship-Borne
Antarctic Tourism*

Appendix 18 — Forecast for Ship-Borne Antarctic Tourism

Year	No. Passengers Landed ¹		% Increase (0r Decrease)	% Forecast/ Actual	'Actual' is 85% of Forecast ²	'Actual' is Forecast Escalated by 8.5%/Year ³
	Forecast	Actual				
1992-93		6,704				
1993-94		7,957	19%			
1994-95		8,098	2%			
1995-96		9,212	14%			
1996-97		7,322	- 21%			
1997-98	10,590	9,473	29%	89%		
1998-99	12,300	9,857 ⁴	4%	80%		
			(Average: 8%)	(Aver: 84% for 2 years)		
1999-2000	14,050	14,762	50%	105%		
				(Aver: 91% for 3 years)		
2000-01	14,175		-4%		12,050	14,175
2001-02	14,500		2%		12,325	15,380
2002-03	15,500		7%		13,175	16,690
2003-04	15,500		0		13,175	18,110
2004-05	16,000		3%		13,600	19,650
			(Average: 9%)			
Projected 5-Year Increase 2000-01 to 2004-05:			11%			

¹ Source: "Initial Environmental Evaluation, Ship Based Tourism by Nine U.S. Organizers, Antarctic Peninsula, South Shetland Island and South Orkney Islands, November 2000-March 2001." International Association of Antarctica Tour Operators. August 8, 2000.

² If IAATO's passenger projections are reasonable and if 'actual' tourist numbers are 85% of the forecast, then the low forecast projection would be 13,600 passengers landing by the 2004-05 season.

³ If IAATO's forecasted 14,175 for the 2000-01 season is reasonable and if the rate of passengers landing increases 8 to 9% per year, then the high forecast projection would be 19,650 passengers landing by the 2004-05 season.

⁴ Over 10,000 total ship and land-based tourists were reported for the 1998-1999 season.